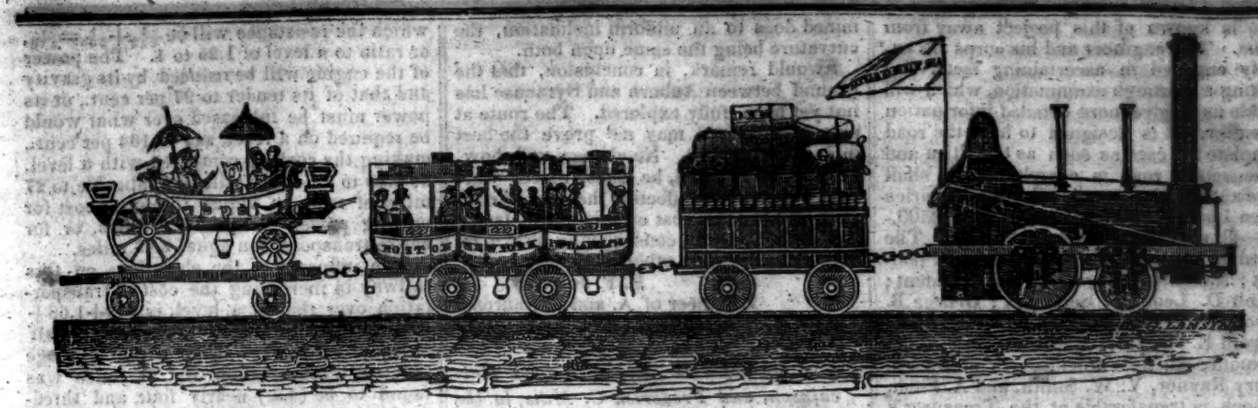

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT No. 35 WALL STREET, NEW-YORK, AT THREE DOLLARS PER ANNUM, PAYABLD IN ADVANCE.

D. K. MINOR, Editor.] SATURDAY, MAY 23, 1835. [VOLUME IV.—No. 20.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, MAY 23, 1835.

The Report of Messrs. Jervis, Hutchinson, and Mills, is continued in this number.

Railroad Shares.—We quote 105 for new, and 107 for old Shares, at which rate transactions to a considerable extent have taken place.—[Charleston paper, May 15.]

The Athens, Ga. Banner says: the annual meeting of the Directors of the Georgia Railroad Company was held in this place on Saturday last, and of the stockholders on the Monday and Tuesday following.

The following information is all we have yet been able to gather, relative to their proceedings, &c.

Three fourths of the stock was represented at the meeting. Among the stockholders, the very best feelings of liberality and unanimity prevailed, with regard to every thing touching the great work in contemplation, and for the early and efficient prosecution of which, liberal measures were unanimously adopted.

The Journal of the proceedings of the stockholders will appear in our next.

James Camak, Esq. of this place, was re-elected President, General Superintendent and Treasurer; William Williams, Secretary; and the following gentlemen, Directors, for the current year, viz.: E. A. Nisbet and Adam G. Saffold, of Morgan Co.; John Cunningham and Thomas G. Janes, of Greene Co.; Absalom Janes and Henry B. Thompson, of Taliaferro Co.; William Cumming, of Augusta; William Williams, John Nisbet, William Dearing, John A. Cobb, E. L. Newton, A. B. Linton, James Shannon, Wm. M. Morton, and Wm. R. Cunningham, of Athens.

Wm. Lumpkin, Esq., one of the former Board, declined a re-election.

Syracuse and Auburn Railroad.—A long and interesting letter from a gentleman at Auburn, has been handed to us,—accompanied by a letter from Mr. E. F. Johnson, Civil Engineer, who is now engaged upon the road,—from which we make the following extract, regretting that we have not room for the whole letter.

We publish this letter with a view of making the work to which it refers more generally known; that we may, if such aid availeth any thing, contribute our mite to its speedy construction. Knowing as we do, from long personal acquaintance, the great fertility and resources of the country through which it passes, and the almost unparalleled rapid growth of the flourishing villages at its two extremes, as well as the enterprise and respectability of those interested in its completion, we have not a doubt of its early construction, and ultimate success and value.

Auburn, May 9, 1835.

Dear Sir,—In reply to inquiries so frequent and general of late, about the Auburn and Syracuse railroad, and its stock, we have requested our Chief Engineer to furnish us a statement, which is enclosed. It is cautious, as is proper it should be, he having just run over one of the proposed rontes, and does not propose to settle any other question than the feasibility of the project, and upon that point it is abundantly satisfactory. To those who only know the ground, from having passed over the distance in the stage, it will be astonishing to find, that the difference between the *average* and *maximum* inclination is only 19¾ feet per mile, about the same as that upon the Utica and Schenectady Railroad, and less than that of the level part of the Mohawk and Hudson, and that the greatest inclination is 30 feet per mile for a distance of 1¾ miles. * * * *

The engineer has not enlarged upon the benefits to the public or stockholders, but says that he is inclined to believe, "that the cost of transportation will not be much, if any greater than upon a road approaching near to a level (as the route examined does to an uniform inclination,) the curvature being the same upon both." The company has the privilege of carrying freight. The benefits, public and individual, were so obvious, to those acquainted with the vicinity and business, that it was found not to be necessary to go from the two villages with the stock to have it taken up, nor to attempt to attract attention from abroad. The whole stock was promptly taken up last fall, upon opening the books, by the inhabitants on the road, who have since sold, at an advance to capitalists, nearly or quite one half. In estimating these advantages, the freight business (as know to the inhabitants of Auburn) of their own village, is a convenient and pretty appendage in the way of nett profits. Not counting upon any increase of this business, as must necessarily be the case by the greater facilities of this road, the business of the Owasco Canal Company, now in progress, and the exhaustless hydraulic power to be created for navigation and manufacturing purposes, by tapping the Owasco lake, by the amount which will be naturally drawn to the road from the Cayuga, Seneca, Owasco, and Skaneateles lakes, and the fertile regions extending from 20 to 40 miles south of the whole line of the road, and also from the western region during the season of canal navigation, and particularly during the months from November to May, when that navigation is closed, not counting upon an increase of the freight business of Auburn, which is now about 10,000 tons, as estimated, annually, and, at a moderate estimate, will afford the company a profit of $1,50 per ton, the subscribers here believed the freight privilege afforded them a security for an amount of profit or revenue, that would more than counterbalance any supposed difference of the passenger business in favor of the Utica and Schenectady road, over this section of the great thoroughfare.

* * * * * * *

I have made a long letter of this, because

little is known of this project away from home. The engineer and his corps are entirely engaged in ascertaining facts, and making a thorough examination, which will enable us to give more detailed information hereafter. It is designed to have the road complete for cars as soon as the Utica and Schenectady road is completed. I shall have answered generally all your inquiries when I add, that the capital stock is $400,000—all subscribed in December last. The board of directors are, Elijah Miller, President; Nathaniel Garrow, Vice President; Asaph D. Leonard, Secretary; George B. Throop, Treasurer; Jno. M. Sherwood, Edward E. Marvine, Richard Steele, John Seymour, Allen Warden, S. Van Anden, Henry Raynor, V. W. Smith, and A. Fitch.

Stock is transferable at the Treasurer's office at Auburn, and at the office of John Delafield, Esq. of New-York, who has been duly appointed the Register of Stock in the city of New-York.

[COPY.]

I have examined one of the proposed routes for the Auburn and Syracuse Railroad.

The distance by this route is 26½ miles, exceeding that by the turnpike about one mile. The greatest inclination is 30 feet per mile for a distance of 1¾ mile. This occurs in the approach to the Nine Mile creek, on the west side, along the Windfall Valley. The total elevation of Auburn above Syracuse is 274 feet, making an average of 10⅓ feet per mile. The difference, therefore, between the *average* and *maximum* inclination is 19⅔ feet per mile, not much greater than the same difference on the Utica and Schenectady Railroad, and *less* than the same difference upon the portion of the Mohawk and Hudson Railway between the inclined planes, the greatest inclination upon which is 37⅔ feet per mile for 1¾ miles, the average descent being 11⅔ feet per mile. So far, therefore, as it regards the *inclination*, the Auburn and Syracuse route is more favorable than the *level portion*, as it is commonly called, of the Mohawk and Hudson road, between the planes. The latter, however, has the advantage in straightness, which will lessen the difference. The portion of the Baltimore and Ohio Railroad, between Baltimore and Parr's Ridge, has an average descent towards Baltimore of 14½ feet per mile, and a maximum inclination in the same direction of 37½ feet per mile. The average is consequently 4½ feet, and the maximum 7½ feet per mile, *greater* than upon the Auburn and Syracuse road. The Amboy and Camden road is stated to have a maximum inclination of 45 feet per mile; this is however only a short distance, three fourths of a mile.

No estimate has yet been made of the probable cost of the road. It will not, however, I imagine, vary materially in proportion to its length, from that of the Utica and Schenectady Railroad, provided a similar plan of construction is adopted. The materials being near at hand, will probably cost less. The damages to turnpike and land proprietors, will undoubtedly be less.

As it regards the cost of transportation, it will be observed that the inclination is eastward, in the direction of the greater trade, the average descent being ten and a third feet per mile. This is perhaps a greater descent than would be required to suit the preponderance in freight, &c. Considering how great that preponderance must be, viz. 2 or 3 to 1, I am inclined to believe that the cost of transportation will not be much, if any greater, than upon a road approaching near to a level, as the route examined does to an uniform inclination, the curvature being the same upon both.

I would remark, in conclusion, that the ground between Auburn and Syracuse has not yet been fully explored. The route at present surveyed may not prove the best in every particular. No change will, however, it is presumed, be made, unless warranted by reasons affecting the cost of construction, or the cost or amount of transportation, and will, consequently, prove favorable rather than otherwise.

E. F. JOHNSON,
Engineer of A. and S. Railroad.
Syracuse, May 8, 1835.

Report of John B. Jervis, Holmes Hutchinson, and Frederick C. Mills, to the honorable the Canal Commissioners of the State of New-York:

(Continued from our last number.)

Inclined plane at Liverpool.

Length, 1.12 miles; rise $\frac{1}{15}$. The *extra* cost of the transit for moving power, taking the average from two semi-annual reports, is 1.80 cts. per mile, 2.02 cents for the total length, per ton; equal, for total cost of transportation, to 0.43 of a mile, on a level.

Sutton and Whiston Planes,

Are each 1½ miles long, and have an inclination of $\frac{1}{96}$ or 55 feet per mile. They incline in opposite directions, and therefore, if the trade was equal in each direction, only one plane should be calculated as affecting the total transportation; as it is obvious, a load passing in either direction would only require additional power to ascend one plane. In the reports of the directors they give the total freight, not distinguishing *between* the different directions; and we are left to determine, from the general character of the trade, whether any and what difference there was. It appears that not more than ⅓ of the tonnage between the two cities passes on the railway; and we, therefore, are led to infer the railway takes the lighter character of freight, which is probably about equal in both directions; and our computation of costs is made on this basis.

This road being worked entirely by locomotive steam power, except the inclined plane at Liverpool, which has stationary power, our computation is made accordingly.

In ascending the plane the resistance will be $\frac{1}{112}$, (friction,) $+\frac{1}{15}$, (gravity,) $=\frac{1}{13}$, or ratio to a level of (3.35 to 1,) or a little more than three and one-third to one. The power of the engine will be reduced by its gravity, and that of its tender, to 70 per cent. of its power, on a level; or to make it equal its power on a level, it must be increased to 142 per cent., which makes the cost of moving power to ascend the plane, as compared with a level, as 4.75 to 1, or four and three-fourths to one. The extra moving power to ascend this plane over a level is equal to the transit of 5.62 miles on a level. The moving power is 26 per cent. of the total transportation, exclusive of the interest account, in which the items of moving power and wagons are blended; this will not be less than 4 per cent., making the total cost of moving power at least 30 per cent. The extra cost of the planes are therefore equal 1.68 miles entire transportation on a level.

The greatest inclination on any part of this railway, except the inclined planes above mentioned, is $\frac{1}{176}$ or 6 feet per mile. It is presumed the ascent of this inclination will regulate the load of the engines, on which the resistance will be $\frac{1}{112}+\frac{1}{176}=\frac{1}{69}$, or ratio to a level of 1.25 to 1. The power of the engine will be reduced by its gravity and that of its tender to 97 per cent., or its power must be increased over what would be required on a level, say to 104 per cent., making the cost, as compared with a level, as 1.30 to 1. This will be applicable to 27 miles of road, on which the extra cost for moving power is equal 8.1 miles, or for entire transportation equal 2.43 miles.

The influence of the elevations on this railway in increasing the cost of transportation over that of a level, is (43+1.68+2.43=4.54,) a little more than four and half miles of level way. The actual average cost of transportation for 31 miles was found to be (4.7,) nearly four and three-fourths cents per ton, which, reduced to a level road, we find to be (4.07,) over four cents per ton, per mile.

An increasing fact is developed in this investigation, in relation to the comparative cost of transportation on inclined planes by stationary and by locomotive steam engines. The plane at Liverpool is worked by stationary steam power, and has an inclination of $\frac{1}{15}$ or 100 feet to the mile. The Whiston and Sutton planes, worked by locomotive steam power, have an inclination of $\frac{1}{96}$ or 55 feet in a mile, being exactly half the inclination of the Liverpool; yet the cost of moving power on the Liverpool to Whiston or Sutton is as 1 to 2.90; showing that locomotive power, for an ascent of 55 feet to the mile, is about three times the expense of stationary power for a plane 110 feet to the mile, calculated for equal horizontal distances. It should be observed, in relation to this fact, that economy of stationary power on inclined planes depends materially on the amount of business. In this case it was about 500 tons per day.

Baltimore and Washington Railroad.

This road commences at a point in the Baltimore and Ohio railroad, about 6 miles from Baltimore, and extends 30 miles to the city of Washington. Its operations are conducted by the Baltimore and Ohio company. In their report of October, 1833, they state the estimated cost at a little over $53,000 per mile, for 26 miles. The estimate for the whole 30 miles is given at $50,000 per mile, in a report on canals and railroads, as presented, 25th June, 1834, to the House of Representatives in Congress. In their report of October, 1834, the directors say the graduation and masonry, (the part of the expenditures liable to the principal contingencies,) is nearly completed; they make no allusion to the probability of the work costing more or less than the estimate; and as it would be natural to do so, if any important disagreement was probable, it is inferred the road would cost the estimated sum; and being so near completed, we have thought it proper to put it in the table. This road has iron rails on stone foundation, except the embankments, which have timber foundation.

Columbia Railroad.

This railroad is 82 miles long, and per last report of the Pennsylvania commissioners, the road has cost, including an estimate for an unimportant amount of unfinished work, $40,450 per mile. It has mostly iron rails, partly on stone and partly timber foundation.

Allegany Portage Railroad.

This railroad is 36 miles long, and per report of Pennsylvania commissioners, has cost, including a small estimate for unfinished work, $47,977 per mile. It has iron rails for a fraction over two-thirds its

length, about half of which are on stone foundation, and the balance on timber; nearly one-third is timber road with iron plates.

Mohawk and Hudson Railroad.

The main stem of this road is 16 miles in length. It has timber rails with iron plates, about half of which are on a stone foundation, and the other half on timber. Cost per mile of double road, $38,107, per company books. (They have also about 3½ miles of single road in branches, that cost $15,847 per mile.)

Actual cost of transportation for freight by locomotive and stationary steam, 3.5 cents per ton per mile. All the ascent for the greatest trade, (being as 3 to 1,) is overcome by one stationary engine, which does not materially enhance the ratio of cost over a level, taking the whole road. Experience has been quite limited on this road, and considering that the ratio of trade in different directions, in connection with the facility of overcoming the principal elevation by stationary power, would not materially increase the cost of transportation over a level, it has not been thought important to reduce it by computation. The cost of transporting passengers has been 1.7 cents per mile.

Saratoga and Schenectady Railroad.

This railroad is 22 miles long. It is constructed with a timber rail, capped with an iron plate, on timber foundation, except about three miles, that has a light stone foundation. This road has a single track; it cost, per report of directors, November, 1832, $11,010 per mile, exclusive of building, &c.; to make a second track of the same character would cost $6.000, making the total cost for double road $17,010 per mile.

Delaware and Hudson Canal Company Railroad

Is 16 miles long, has 5 mile of double and 11 miles of single track. The valleys on this road were generally bridged with timber. The road is timber with an iron plate. It cost originally, including stationary engines, about $10.500 per mile, (the exact amount not known.) To have made it double would have raised the expense to $14,000 per mile; average annual repairs for four years is $623 per mile. Transportation, when the business is at 250 tons per day, is 4 cents per ton per mile, and when 500 tons per day, is 3 cents per ton per mile. This arises mostly from the cost of operating the planes, which is nearly the same in both cases.

The ascent of this road (855 feet) is overcome by five stationary steam engines, working on planes whose total length is 2¼ miles. The cost of motive power for 500 tons per day, averages essentially the same as it does for horse power on a level, having the same in horizontal length. From the summit the principal descent is effected by three self-acting engines, so arranged that the loaded waggons draw up the empty ones: and the balance of the declivity is advantageously arranged for a descending trade. The economy in the use of stationary steam power, arising from the cheapness of fuel, and the great regularity which may be obtained in a coal business, and the comparatively small amount of agencies to conduct the business, leave no doubt on our minds, that transportation is effected on this road as cheap per ton per mile as a general business could be on a level road.

Newcastle and Frenchtown Railroad

Is 16 miles long; timber rail capped with iron plate, about one-third on light stone foundation, and the remainder on timber; cost $30,000 per mile, (see report of committee on roads and canals to Congress, January 25th, 1834.)

Camden and Amboy Railroad.

The part extending from Amboy to Bordentown is 33 miles in length, is believed to be entire iron rail, partly on stone and partly on timber foundation; cost (as per congressional report above mentioned) 30,000 per mile.

South Carolina Railroad,

Is 130 miles long; timber rail capped with an iron plate. This road is built on piles; no embankments made in the grading; cost about $7,000 per mile. It is not known whether it is a single or a double road, but believed to be mostly single track.

There are several important railroads in the United States, which we should have been gratified to have added to those above given. But we have not the information in relation to them, that would enable us to derive any practical advantage. There are others that we have not thought proper to introduce in a question that relates to the general utility of railroads as public thoroughfares: they are roads made mostly for local objects, or for short distances, where the surface of the ground is nearly level, and the road made to conform nearly to the natural level or inclination, and very little expense incurred to remove those irregularities in the surface, which in a road of any considerable length and importance are generally encountered, to obtain an economical grade: and the superstructure of such roads is usually made in an imperfect manner, not calculated to serve the purpose of accommodating an important general trade.

In the roads described, it is believed a fair view may be obtained of the general question of cost. In their *graduation* some have been of an expensive character, to wit: The Baltimore and Washington, Allegany Portage, the Columbia, Mohawk and Hudson, and a part of the Baltimore and Ohio, though on the average the latter cannot be much above medium: the Camden and Amboy, and the New-Castle and Frenchtown, rather below a medium, and the Saratoga as very favorable. The South Carolina road having been placed on piles, excavation has been avoided as much as possible, and embankments omitted altogether, by which the expense of grading has been very little. The general character of the superstructure has been stated; and their rails, or the foundation of the rails, appear to be, to a great extent of timber.

The superstruction of railroads, when composed of timber with the rail capped with an iron plate, will cost, for a double track, from 6,000 to $10,000 per mile, according to the value of timber, and the stability given to the road; this is exclusive of grading. The cost on the Baltimore and Ohio, for this kind of road, was $8,852 per mile. When composed of iron rails laid on stone foundations, the cost will vary from 18 to $25,000, according to the convenience in obtaining stone, the extent of the ballasting, and the weight of rail that may be adopted; the probable average may be $22,000 per mile. The difference, then, between a medium of the two kinds, is $14,000 per mile. To have adopted the iron rail on a stone foundation in the roads mentioned, would have materially increased their average cost. But in the first construction, it is usual, even when iron rails are adopted, to put down a timber foundation to support them on the embankments, until their embankments have time to become fully settled.

The first railways in England were constructed of timber without any iron. The timber being found to wear too rapidly under the wheel, the iron plate was then put on. From this rude beginning in railroads, their advantages began to be developed; and experience soon suggested improvements. Hence we find the wooden rail soon abandoned, even in the coal districts. Cast iron rails on a stone foundation followed timber, and now wrought iron is generally used in preference to cast iron. These remarks are introduced to show the result of experience in England. In this country timber will doubtless be used to a greater extent, and for a longer period than it was in England. The cheapness of timber, the want of capital, and the limited amount of business in many places, will operate as causes to produce this result. We already observe, however, in this country, a departure from the use of timber rails on several important railroads. Among those who have critically attended to this subject, there is probably very little difference of opinion in regard to the most suitable material for rails and their foundation, when an extensive business may be anticipated, and particularly where a high velocity is an object. The Baltimore and Ohio Railroad Company, after an experience of several years with timber rails, have come to the following conclusion, as appears in their last annual report: "In the construction of the Washington road, the board have had regard to its durability, not less than to making it a source of immediate profit to those interested in the undertaking. The experience of the main stem, has *conclusively* shown how important it is to avoid the expense of repairs of the railway, which not only materially affect the revenue, but occasion constant *interruption* and *inconvenience* to the *travel* on the road. True economy consists in constructing the road, in the first instance, so as to obviate the necessity of *frequent* repairs, and to enable the *motive power* used in transportation to be employed to its fullest effect, without the *fear* of injury to the rails or bridges over which it passes in the performance of its daily work."

Timber is found to be less durable in a railroad than in almost any other situation. The action of the carriages tend to open the pores of the timber, which renders them more liable to imbibe moisture; all horizontal joints are much exposed under this action, and particularly that under the rail plate. There are, no doubt, situations where timber may be advantageously adopted. The cheapness of this article, the scarcity of stone for foundations, the scarcity of capital, limited extent of business, and the experimental character of the particular investment, will often present arguments in favor of its adoption. At the same time we are fully of opinion, that on all railroads which constitute important avenues of communication, the period is not distant when timber rails will be wholly abandoned for iron.

The question in relation to the average cost of railroads, it will be difficult to determine, as the graduation will be very different at different places. The table given of the cost of several railroads, excluding the Liverpool and Manchester, would afford an average of $30,893 per mile. Had all these roads been constructed entirely with iron rails and stone foundations, their average cost would probably have been between 35

and $40,000 per mile. Taking all the railroads designed to accommodate a large general trade that have been constructed in this country, and add to their expense what would be required to complete an iron rail with stone foundations, we believe the cost for a double road would not fall below $35,000 per mile; and to reduce the same to a timber road of the best character, would not be less than $25,000 per mile. The grading in both cases is supposed to be done in a permanent manner. We are aware of the fact, that railroads, in some instances, have been made for much less; but for the reasons before given, we do not believe them entitled to a place in this examination, which is designed to investigate the utility of railroads as a means of general intercommunication of trade. There are, no doubt, many situations where the favorable formation of the country, and the facilities for obtaining materials, will reduce the cost below the amount stated above, and a less expensive road may be sufficient for the trade to be accommodated. But there will be others that will be more expensive, as experience has fully demonstrated; and our object is to reach an average result for the accommodation of a general trade, where expedition, regularity, and economy in the moving power, will be important. It should be observed in relation to this question, that the cost of a railroad will depend materially on the amount of tonnage, and the speed it is necessary to maintain. This arises from the economy of motive power; for instance, where a small amount of business is to be accommodated, it will be economy to apply greater motive power, and avoid expensive graduation; on the other hand, a large amount of trade will induce greater expenses in bringing the lines of graduation to the most favorable standard for economizing this power.

Remarks in relation to repairs on Railroads.

Experience on this point is yet quite limited. We have the account of two years on the Baltimore and Ohio road, four years on the Delaware and Hudson company road, and four semi-annual statements of the Liverpool and Manchester road. We have also, in relation to the latter, a general statement of the half year preceding and the half year subsequent to the four full reports, from which we are led to infer that no material variation occurred for three years. The average of the three roads is $1.040 per mile per annum.

There is a great difference in the annual expense of repairs for these roads, which suggest the propriety of examining into the cause.

The moving power on the Baltimore and Ohio, and also on the Delaware and Hudson company's road, admitted, for freight, only a moderate speed, probably seldom exceeding 4 miles per hour, and nearly the same amount of tonnage was conveyed on each: on the latter, no passengers are carried; on the former, the passengers constitute about half the business.

The Baltimore and Ohio road has less timber in its structure, though it has a large majority of timber road. The Delaware and Hudson Company road is about $\frac{2}{3}$ single track, and considering the passenger business has not over half the use, and still its repairs are more than 50 per cent. higher. Two years, with a moderate amount of trade, on a timber road, would not give a fair average of the cost of repairs, and the condition of the two roads at the end of the year, in regard to the age and durability of their timber, may be very different. We are, therefore, led to conclude that further experience will show the repairs on the Baltimore and Ohio road, as the business increases, to be greater than they have hitherto been.

The Liverpool and Manchester road has cost over five times as much for repairs as the Baltimore and Ohio, and over three times as much as the Delaware and Hudson Company road. The Liverpool road was made in the most substantial manner, with very little curvature. The Baltimore road is very much curved, which increases the expense of maintaining the parallelism of the rails. The statement of the cost of repairs and maintenance by the directors of the Liverpool road is very explicit, and continued for successive terms with very little variation; leaving no ground to misunderstand the subject. The amount of business on the Liverpool has been from three to four times as great as on the Baltimore, for equal terms of time; and the velocity of travelling, both with freight and passengers, has been also much greater on the former than on the latter. In view of all the facts we have obtained, we are led to the conclusion, that the amount of business, and the velocity of travelling, has a material influence on the question of repairs. In the last report of the directors of the Liverpool road, they allude to the expense of maintaining their road on the Whiston and Sutton planes, in consequence of the high velocity which the engines and wagons often obtain in their descent; and propose to lay heavier rails to guard against this inconvenience. In a report recently made to the directors of the London and Birmingham rail-way, by R. Stephenson, (late engineer of the Liverpool road,) on the propriety of adopting the undulating plan, he urges, as an objection to this plan, the injurious tendency of the high velocities obtained in the descents to the road and particularly to the locomotive engine, as a reason that he considers conclusive against it.

The repairs of a railroad composed mostly of timber will generally be much less for two or three years after it is put into operation, than the average for a term of ten or fifteen years. Our experience is limited in this branch of the investigation, but from the facts we have obtained, we are led to the conclusion, that the average expense of repairs for a road, designed to accommodate a large general trade requiring a high velocity, will not be less than that stated as the average of these roads, viz: $1,040 per mile per annum.

Transportation on Railroads.

The cost of transportation (reduced to a level road,) on the Baltimore road, we have found to be 3.05 cents per ton per mile, and 4.07 cents per ton per mile on the Liverpool road. In the former case, it is done by horse power; in the latter, by locomotive (except on one plane,) steam power. The ratio of cost of motive power to the entire cost of transportation is for the Baltimore as 4 to 10; and for the Liverpool road, as 3 to 10. It, therefore, appears, that the Liverpool road, with 10 per cent. less ratio in cost of motive power, (which makes the motive power nearly equal on the two roads,) costs one-third more for entire expense of transportation. If our accounts can be relied on as presenting accurate results, it would appear highly probable the extra expense in repairs and management of the business, was incurred in consequence of the greater speed maintained. Some abatement should doubtless be made, for the ratio of difference in expense of loading and unloading, which, in consequence of its being shorter, would bear heavier on the Liverpool road than on the Baltimore. The accounts for the Liverpool transportation are presented in much detail, and are very satisfactory in their character. Those for the Baltimore road are not given in as much fullness and detail, but we have no reason to doubt their accuracy. It further appears, that horse power is a little more expensive for motive power, at a low velocity, than locomotive steam, at a high velocity, as compared for the two roads. But this would not be the case if the power was reversed for the two roads, as the short ascents on the Baltimore road would greatly depress the economy of steam power. The average cost of transportation on these two roads, when reduced to a level, is 3.56 cents per ton per mile. This allows no profit or toll; the cost stated for the Mohawk and Hudson road is 3.5, and for the Delaware and Hudson Company's road is also 3.5 cents per ton per mile, as the nett cost. It may, therefore, be considered that experience thus far has settled the cost at $3\frac{1}{2}$ cents per ton per mile, on a level road.

It has been shown in this investigation, that where locomotive steam power is used, it is important to its economy, to have all the inclination reduced to a uniform angle, and the curves to a uniform radius, otherwise the traction that occurs on the sharpest curves, and greatest ascents, will determine the load of the engine. It is obvious that the load of the engine must be regulated by its ability to overcome the greatest resistance that occurs on the road over which it passes, unless extra power is stationed on the line to aid in passing ascents: the inconvenience of stationary power would prevent a resort to this method, unless the increased power required was considerably greater than was generally necessary on the route travelled. This consideration is highly important where a large general trade is to be accommodated, and accounts for the great expense that is often encountered to bring the grade to the most favorable standard.

The cost has been shown to be $3\frac{1}{2}$ cents per ton per mile on a level, and as railroads are not often entirely level, it has been thought proper to a full understanding of the subject, to present a statement, showing the comparative economy in motive power, by locomotive steam engines on roads of different inclinations. In the calculations, the engine is assumed to weigh $6\frac{1}{2}$ tons (13,000 lbs.,) with 7,000 lbs. on its working wheels; adhesion at 10; the weight of the tender at 7,000 lbs.; resistance from friction $\frac{1}{227}$. The load carried is exclusive of the tender, and includes freight and wagons. Two-thirds of the gross load will be tonnage goods.

On a level the gross load will be 75.25 tons; on a road or section, having an ascent of 10 feet per mile, 49.53 tons—do. 20 feet, 37.35—do. 30 feet, 27.24—do. 40 feet, 20.22—do. 50 feet, 17.04—do. 60 feet, 13.92—do. 70 feet, 11.31.

In the load on a level, we have 50 tons exclusive of wagons, taking the cost of motive power at 40 per cent. of the entire cost of transportation; the total cost at the level being $3\frac{5}{15}$ cents.

The total cost on an ascent of 10 feet per mile is per ton, 4.20 cts.—20 feet, 4.90—do. 30 feet, 5.95—do. 40 feet, 7.28—do. 50 feet, 8.19—do. 60 feet, 9.66— do. 70 feet, 11.41.

There are engines of a larger size than the one assumed; but it is the most approved at this time, in reference to the weight of engine, and the weight of the working wheels. This however is unimportant, as the comparison will not be at all affected by varying the power of the en-

gine: the ratio between a level and the ascents will remain the same notwithstanding.

Costs of Canals.

We subjoin a table marked A, containing the cost of 50 canals in England: this table gives the name of each canal, the total cost in pounds sterling, cost per mile, length of each canal in miles, lockage in feet, date of completion, original cost for each share, and the value and dividend of each share in 1821, in March 1828, in November 1831, in 1833, and on the 21st of October, 1834. Forty-five of these canals, being the most important in England, have an aggregate length of 1,464 miles. We also subjoin a table of the principal railways; only one, however, of those which are completed and in operation, (the Liverpool and Manchester,) is calculated for general trade.

In table B, we give a view of the principal canals in this country: it contains all the particulars that we were able to obtain of 40 canals, principally in the northern and middle States. It has the names of the canals, the length of the main trunk and feeders, depth of water, width of surface, number of locks, their length and width, and the aggregate lockage on the canals and feeders, number of dams, date of completion, cost per mile, total cost, and the tolls for each for the years 1833 and 1834.

The information contained in the tables for the canals of this State was obtained from public records and from documents in the Comptroller's office. That for the Pennsylvania and the other canals were taken principally from the official reports, and from information derived from the officers having charge of these canals respectively; we have also been assisted in the inquiries by private records and memorandums in our possession.

The Erie canal extends from the Hudson river at Albany to Lake Erie; is 363 miles long, and has 689 feet of lockage; the canal is 40 feet wide on the surface, 28 feet wide at the bottom, and four feet deep. The locks are 90 feet long, between the gates, 15 feet wide, and built principally of lime stone, laid in hydraulic cement, with the front stone cut and laid in courses. Although there is a small amount of elevation, compared with the distance, being but $1\frac{9}{10}$ feet of lockage per mile, there are a few places that presented formidable difficulties in the construction: a part of the distance between the Hudson and Schenectady, the rock excavation at Little-Falls, and the deep cutting in the mountain ridge west of Lockport.

The Champlain canal is the same dimensions as the Erie canal; the locks are constructed in the same manner, except they are 7 feet longer, and one foot less width. This canal is 64 miles long, and extends from the junction 9 miles north of Albany to Lake Champlain. The summit is supplied with water from the Fort Edward pond, and by a navigable feeder from the Hudson river, taken out above Glen's-Falls.

The Glen's-Falls feeder is 7 miles long, and with the pond, makes a navigation of 12 miles in length; there is a descent of 132 feet by 13 wood locks.

The Oswego canal is constructed similar to the Erie canal, but has nearly one half river navigation. The locks are of the same dimensions and quality, except one, which is built of wood.

This canal extends from the Erie canal at Syracuse to Lake Ontario.

The Cayuga and Seneca canal is, with the Cayuga branch, 23 miles long, connects the Erie canal at Montezuma with Seneca lake at Geneva, one half of which is river navigation. It has 11 wood locks, that overcome an elevation of 80 feet. The dimensions of the canal and locks are similar to those on the Erie canal.

The Crooked Lake canal is 8 miles long, connects the Crooked and Seneca lakes and has 269 feet of lockage; this, although the locks are of wood, is the most expensive of the State canals; the large expenditure is accounted for by the great elevation overcome, and by the difficulties in construction in the narrow rocky valley of the outlet.

The Chemung canal extends from the head of the Seneca lake to the Chemung river: it is 23 miles long, and the summit is supplied by a feeder of $13\frac{1}{4}$ miles in length, from the Chemung river, at the Chimney Narrows in Steuben county. This canal and feeder, (as also the Crooked Lake canal,) is 42 feet wide on the surface, 26 feet wide on the bottom, and four feet deep; the locks are of wood, connected with the upper level by a wall of masonry at the head. The length of navigation, including $2\frac{1}{4}$ miles of pond in the Chemung river above the feeder dam, is 39 miles, with a lockage of 516 feet, and is the cheapest of the State canals.

The Erie canal cost	$19,255	49	per mile.
Champlain	15,520	95	"
Oswego	14,879	93	"
Cayuga and Seneca	10,295	85	"
Crooked Lake	19,597	11	"
Chemung	8,504	96	"

The aggregate cost of the six State canals, paid by the Canal Commissioners, for their construction up to the time when they were completed, for the 558 miles of navigation, is $9,692,106.68, being an average cost of $17,367.57 per mile.

The Delaware and Hudson canal extends from the Hudson river, near Kingston, to Honesdale on the Lackawaxen river, in the State of Pennsylvania. This canal is 108 miles long, 36 feet wide on the surface of the water, and four feet deep. The locks are 76 feet long, nine feet wide in the chamber, 110 in number, and overcome an elevation of 1,073 feet: 60 of the locks are of hammered stone masonry, and 50 are composite, of stone and wood.

There was some formidable rock excavation in the valley of the Delaware and Lackawaxen rivers, which increased the expense of construction. The average cost of this canal was $20,665 per mile.

Pennsylvania Canals.

The Pennsylvania State canals are divided into 9 divisions, and they have an aggregate length of $601\frac{1}{2}$ miles. The main line of these canals form a communication in connection with the Columbia and the Portage railroads, between Philadelphia and Pittsburgh. Between these places there are 282 miles of canals and 119 miles of railway.

The Delaware division extends from Bristol to Easton, $59\frac{3}{4}$ miles; and in the valley of the Susquehannah, including the west and north branch, there are 183 miles of canal, besides the Beaver and French creek divisions, west of the mountains. These State canals have 1,933 feet of lockage, and their total cost is $13,301,235.69, or an average of $22,113.43 per mile.

Beside the State improvements there are three important canals in Pennsylvania owned by corporations, viz: The Schuylkill, the Lehigh and the Union canals.

The Schuylkill canal extends from the city of Philadelphia up the river of that name, 108 miles, to the coal district. This work has 62 miles of canal and 46 miles of pools, formed by 28 dams across the Schuylkill river. There are 92 lift and 28 guard locks, and the total lockage is 588 feet. This canal was completed in 1825, and the business upon it has increased so rapidly that it has been necessary, and the directors are now constructing double locks to accommodate the trade. At its completion (in 1825,) the canal cost $16,741.26 per mile.

The Lehigh canal was constructed principally for the transportation of coal, and extends from Mauch Chunk to Easton on the Delaware river, $46\frac{3}{4}$ miles. This canal is 60 feet wide on the surface and 5 feet deep; the locks are 100 feet long (except 4, which are 130,) and 22 feet wide in the chamber; and its large dimensions have, doubtless, added much to its cost.

Coal that is brought from the Lehigh mines down this canal, may be sent to Philadelphia by the Delaware canal, or to New-York through the Morris or the Delaware and Raritan canals. This canal cost $33,610.75 per mile.

The Union canal connects the Schuylkill and Susquehannah rivers; this, although a small canal, 36 feet wide on the surface of the water, and 4 feet deep, has been expensive in construction. Connected with this canal is a feeder of 24 miles in length, to supply its summit level. This feeder is navigable, and a railroad of 4 miles in length extends to the coal mines. A large expenditure has been incurred to construct reservoirs, 3 feeders, and for the use of two steam engines, of 100 horse-power each, to supply the summit level with water, and for several miles the sides and bottom of the canal have been planked, to prevent leaks in the lime-stone districts. This canal cot $18,518.51 per mile.

The three canals have 1,452 feet of lockage, and cost $5,354,151.13, and the average cost of the $262\frac{1}{4}$ miles is $20,377.36 per mile.

The State of Ohio completed their canal, from Lake Erie to the Ohio river, in 1832, which, together with the Miami canal and feeders, make an aggregate of 400 miles of navigation. The total amount of lockage is 1,557 feet; the locks, 184 in number, are constructed of cut stone laid in hydraulic cement; and the total cost of the canals and appendages, as appears in the Canal Commissioners' report of 1833, is $4,189,539.64, or an average of $10,473.84 per mile.

The Chesapeake and Ohio canal will form a communication from the City of Washington, 342 miles in length, to Pittsburgh. That portion nearly completed and navigable extends from Tiber creek, in Washington city, 109 miles to a point 8 miles west of Williamsport. This canal varies from 5 to 7 feet in depth, and from 50 to 80 feet in width; the ascent is 353 feet, overcome by 44 lift locks 100 feet long by 15 feet wide in the clear, constructed of cut stone masonry laid in hydraulic cement.

This canal is situated in the valley of the Potomac; it is of large dimensions, and formidable difficulties have been encountered in its construction. The amount expended and required to complete 109 miles is $4,164,732.04, or an average cost of $37,291.12 per mile.

There are five canals in New-England, having an aggregate of $170\frac{1}{2}$ miles in length, with $1,363\frac{9}{10}$ feet of lockage, constructed by private corporations at an expense of $2,187,000, or an average of $12,838.71 per mile. The Blackstone canal between Worcester and Providence, of 45 miles long, has 48 locks of cut granite, laid in

cement; the other four canals have wood locks.

Three of the canals embraced in the tables are of large dimensions, and were constructed of suitable capacity for the navigation of coasting vessels.

These canals connect the great bays of the Atlantic, as follows, viz: The Dismal Swamp, between Albemarle sound and the Chesapeake bay; the Delaware and Chesapeake canal, across the peninsula between those bays; and the Delaware and Raritan forms a channel for coasting vessels between Philadelphia and New-York. The above, with a canal between Barnstable and Buzzard's bays, were originally designed as the four great cuts to connect and form a continuous inland coasting navigation from Boston Harbor to the bays of North Carolina. One of these canals, the Delaware and Chesapeake, was attended with peculiar difficulties in its construction, but neither are considered as proper for a standard of comparison.

The following table exhibits the length, lockage, and cost of some of the principal canals.

	Miles.	Lockage. Feet.	Cost per mile. Dolls.	Total cost. Dolls.
6 N. York & Canada canals,	538	2,016	12,367 57	9,692,106 68
1 Do. Del. & Hudson,	108	1,073	20,665 00	2,231,820 00
9 Penn's & Md. canals,	901¼	1,937	22,413 44	13,501,235 60
1 Do Schuylkill, Lehigh, and Union,	202¾	1,458	29,377 36	5,354,151 13
2 Ohio State canals,	400	1,557	10,473 84	4,189,539 64
1 Ches. & Ohio canal,	109	353	37,291 12	4,164,732 04
5 N. England canals,	1791	1,363½	12,838 71	2,189,000 00
27 canals.	Yards,	2,210 9,748	18,608 41	41,122,585 18

By the preceding table it appears that 27 of the principal canals of this country, having an aggregate length of 2,210 miles, with 9,748 feet of lockage, embracing many difficulties, and constructed in nine of the United States, in a great variety of locations, have cost $41,122,585.18, or an average of $18,608.41 per mile.

Repairs of Canals.

It appears from the report of the Comptroller, Assembly Document, No. 216, of 1835, that the repairs of the State canals, including salaries of superintendents and lock-tenders, have been, per mile, for the last year as follows, viz: for the Erie canal, including 14 miles of the Champlain, and the sloop-lock at Troy, $883.78; Erie and Champlain canal, $1,005.03; Oswego canal, $320.63; Cayuga and Seneca, $401.46.

The repairs for the last 3 years, ending September 30, 1834, have been annually, per mile, for the Erie and Champlain canal, $826.13; Oswego canal, $313.13; Cayuga and Seneca canal, $339.88.

And for the last 6 years, from 1829 to 1834, both years inclusive, ending on the 30th September, the repairs have been annually, per mile, for the Erie canal, $603.76; Champlain canal, $681.01; Oswego canal, $309.19; Cayuga and Seneca, $301.07.

In the Document before alluded to, there is a division of the cost of repairs upon the Erie canal, stated separately, and the amount for the last year is per mile, for 159 miles, from Buffalo to Montezuma, $600.47; for 73 miles, from Montezuma to 7 miles west of Rome, $660.34; for 146 miles, from 7 miles west of Rome to Albany, including 14 miles on the Champlain and the Troy dam and lock, $1,304.04.

The repairs of the Erie canal in 1829 averaged $493.12 per mile, and in 1834 $883.78, being an average in the cost of repairs, of 79 per cent.

The lockages at the first lock west of Schenectady, in 1820, were $12,610; in 1834, were $93,911. An increase of 80 per cent.

The last results, as do also the comparisons of former years, indicate that the expense of the repairs of the Erie canal increases in nearly the same ratio as the business.

The repairs on the Delaware and Hudson canal, for the last 4 years, ending December 31, 1834, was an average of $527 per mile; and for the year 1833, including the salary of superintendents and lock-tenders, on the Schuylkill canal, was $710.44 per mile.

Cost of transportation on Canals.

In this inquiry we have selected three canals that have a large amount of business and those that have their prices well established.

The Erie canal, and the Delaware and Hudson canal, in this State, and the Schuylkill in Pennsylvania. We are not able to give the items that compose the cost of freighting upon canals, with the same certainty as that expense has been reported by the Liverpool and Manchester, and the Baltimore and Ohio Rail Road companies; but we assume the prices, paid on canals for down freight, upon articles of the greatest tonnage.

The Schuylkill canal in 1833, had 361,054 tons of down freight, of which 250,558 was coal from the mines; and the up freight, consisting of merchandize, plaster, iron ore, &c., amounted to 84,795 tons. The price for the transportation of coal is one cent per ton per mile, exclusive of tolls.

The Delaware and Hudson Canal Company, in 1833, sent to market from the mines, 111,777 tons of coal, and the merchandize up amounted to 9,700 tons. In 1834, the coal sent to the Hudson river was 45,000 tons. The established price of transportation was $1.12½ per ton of 2,240 pounds of coal for 108 miles by this canal, from Honesdale to the Hudson river, equal 1.041 cents per ton per mile.

The property arriving at tide water, by the Erie and Champlain canals, in 1834, as appear from official statements, was equal to 553,825 tons; passing from tide water 114,608 do.—making an aggregate of 668,433 do.

The proportion of down freight or property going to market, is to merchandize or tonnage going from tide water, as 4.83 to 1, or as 5 to 1 nearly.

The cheapest prices of freight on the Erie canal are paid for staves, timber, wood, stone, lime, plaster and salt; the highest charges are for merchandize. We put down the rates, exclusive of tolls, as charged by the different forwarding lines, although goods are frequently taken up the canal by boats unconnected with the lines, at about half those rates; this higher price is intended, besides the cost of freighting, to pay for the risk to which the forwarding merchant is liable as a common carrier.

During the season of navigation last year, there was brought down the canals, 32,670 tons of staves, and we are informed, that the average price of transportation of this article has been $2 per ton for the last 6 years, from Tonnawanta to Albany, exclusive of tolls. The distance is 352 miles by the canal, and this would give only $\frac{17}{100}$ of a cent per ton per mile.

There was also sent down—181.016 tons of boards and scantling, at $\frac{74}{100}$ of a cent per mile; 96.642 do. of wood, do. at $\frac{12}{100}$ do.; 23,894 do. salt, to Buffalo passing Utica, at $\frac{17}{100}$ do.; 70,372 do. merchandize do. at $2\frac{15}{100}$ do.

Making an average of the above prices, of $\frac{33}{100}$ of a cent per mile for a ton of 2,000 pounds.

Flour is a large item of the down freight; there is about 120,000 tons sent to market annually, and this, together with provisions, may be taken as a standard of comparison.

Flour has been carried from Rochester to Albany, 269 miles, by transient boats, as low as 18 or 20 cents per barrel, exclusive of tolls; we are informed, however, that contracts for freight to a large amount have been made by millers at Rochester, with the established lines of forwarding merchants, for the ensuing year, at 24 cents per barrel, from the first of June to the first of October; before and after those periods, at 30 cents per barrel for flour, exclusive of tolls.

For this comparison we will take an average between these two prices, which is 27 cents per barrel, and this is believed to be about the average price paid for freight on the whole tonnage of the Erie canal during the season of navigation.

At the above rates the prices of transportation on the three canals, exclusive of tolls, would be, for a ton of 2,240 pounds, as follows, viz: on the Erie canal, 1.04 cents per ton per mile; on the Delaware and Hudson, 1.041 do.; Schuylkill, 1.00 do.; or an average of a little over one per cent. per ton per mile, on the three canals.

For a more perfect comparison of the cost of transportation, we will reduce these canals to a level, by an allowance of 20 feet of lockage on the Erie and Schuylkill, as equal to a mile of distance, and in consequence of the less crowded navigation, of 30 feet to the mile on the Delaware and Hudson canal.

The distance on the Erie canal from Rochester to Albany, is 260 miles, and the lockage 626 feet, and reduced to a level would be equal to 300$\frac{3}{10}$ miles.

The Schuylkill canal is 108 miles long, and 588 feet of lockage, and reduced to a level in the above mentioned ratio, is equal to 137 4-10ths miles.

The Delaware and Hudson is 108 miles long, and has 1,073 feet of lockage, and is equal to 135 8-10ths miles level canal.

On a level canal, the prices of freight would be for the Erie canal 828-1000ths of a cent per ton per mile; Schuylkill 735-1000ths do.; Delaware and Hudson 766-1000ths do.; and the average price of the 3 canals would be, without toll, 793-1000ths, or a little less than 8-10ths of a cent per ton per mile.

In Hazard's Register, vol. 15, page 112, it is stated that the Lehigh, the Delaware, and Delaware and Raritan canals, paid last year 2-10ths of a cent per ton per mile, for the transportation of 105,000 tons of coal; the contractor finding every thing, except paying the tolls.

General Remarks.

Having presented such facts as are within our knowledge, with the circumstances connected with them; together with such explanations of principles, as appeared to us necessary to a correct understanding of the subject in its practical character, we have not thought it would aid in the object of inquiry, to attempt any precise ratio of comparative cost of construction or repairs, between canals and railroads: the reason for this is to be found in the obvious modification to which any ratio must be exposed, in the varied local circumstances that will be encountered in the progress of improvements of this character, and whose tendency would render any ratio of little or no practical value. We, therefore, refer to the several statements, and particularly the tabular views, for information, which we believe, when applied to any known case, will afford some useful hints in regard to the relative merits of the two different modes of facilitating internal communication. We

may, however, be permitted to state, what appears conclusive from the facts presented, that canals, on the average, have thus far cost less than railroads, both in their construction and repairs.

In regard to their relative merits as affording the means of transportation, there is less difficulty in reaching an approximate ratio. In reducing them both to a level, we attain for general purposes, a fair standard of comparison. Taking the facts we have obtained as a basis, we find the relative cost of conveyance is as 4.375 to 1, a little over four and one-third to one, in favor of canals: this is exclusive of tolls or profits. If the cost of construction, the annual cost for repairs, and the amount of tonnage, were the same on a canal as on a railroad, then the same rate of toll would produce the same rate of profit on each. Our examinations have shown, as before stated, that railroads in the average, cost more than canals, both in their construction and repairs. But for comparison, we assume a case in which they are equal, and charge the same toll. The average tolls on the Erie canal are less than one cent per ton per mile: assuming an average toll of one cent per ton per mile, the ratio of the entire cost of transportation and toll is, as (2.5 to 1,) two and a half to one, in favor of canals. In the preceding computations, the cost of transportation on railroads is the nett cost, as reported by railroad companies, allowing no profit on this business, while the charges on the canals is at contract prices, which are supposed to yield a profit to the carrier. The cost of transportation on canals, as previously stated, is the average on the Erie canal, the Delaware and Hudson canal, and the Schuylkill canal; on the two latter, the cost of transporting coal only is known; and the total average of the three canals is almost exactly the same as the average price for the several different articles transported on the Erie canal. The preceding calculations are confined to a velocity not much exceeding 50 or 60 miles in 24 hours. We have not instituted any investigation to show the relative economy in high and low velocities. For the conveyance of freight, we are of the opinion, canals are not well adapted to any material increase of speed beyond 3 miles per hour; and as the speed on half of the railroads embraced in this computation is from 10 to [illegible] per hour, we may consider this comparison as nearly similar to one of high velocity on railroads, and low velocity on canals. And goods that can afford to pay the difference above indicated, for the saving of time, would hold the two kinds of conveyance in equilibrium. The amount that would find so great an object in the saving of time, in comparison to the total quantity requiring transportation, it is believed would be small. In relation to the conveyance of passengers, the saving of time is highly important, and the railroad becomes eminently the superior method of communication. We are, therefore, led to the conclusion, that in regard to the cost of construction and maintenance, and also in reference to the expense of conveyance at moderate velocities, canals are clearly the most advantageous means of communication. On the other hand, where high velocities are required, as for the conveyance of passengers, and under some circumstances of competition, for light goods of great value, in proportion to their weight, the preference would be given to a railroad.

It may be observed in favor of railroads, that they admit of advantageous use in districts where canals, for the want of water, would be impracticable. This advantage often occurs in mining districts, and sometimes for general trade, where it is necessary to cross dividing ridges at a level too high to obtain water for their summits.

The facts and reasonings presented, we believe, clearly show that both canals and railroads are highly important means of internal communication; that each has its peculiar advantages, and will predominate according to the character of the route, and the trade for which it is intended to provide.

Respectfully submitted,
JOHN B. JERVIS,
HOLMES HUTCHINSON,
FREDERICK C. MILLS,
Civil Engineers.

Albany, 14th March, 1835.

[*From the National Intelligencer.*]

THE ALLEGHENY ARSENAL.—Pennsylvania can boast of having within her territories one of the finest arsenals in the Union; probably for neatness and symmetrical arrangement, the handsomest in the world. I mean that extensive military establishment recently named after the beautiful river 'Allegheny,' and more extensively known as the United States Arsenal near Pittsburgh. This ordnance depot occupies a plat of ground containing thirty-one acres one rod and thirty-three perches, and one hundred and thirty-two feet from the river above mentioned, to the Philadelphia turnpike road, and entirely surrounded by a handsome, well built wall. The order in which the ground is divided is as follows:—

1st. The lower park, comprising a military store, built of free stone, three stories high; two carriage houses and three timber sheds, with brick pilasters; a river wall of massive stone, containing one thousand seven hundred and twenty perches.

2d. The arsenal yard, a square with the following buildings: The main arsenal or magazine of arms, three stories, with a pedument or tower one hundred and twenty feet by forty; upon the second floor the arms are arranged in racks, and present to the 'coup d'œil militaire' a splendid sight; it is in fact a military museum. Here are deposited the relics of former times; revolutionary trophies, taken at Saratoga, Yorktown, and St. John, present themselves at the entrance, and remind the visiter of Washington, Lafayette, Gates, and other worthies of past days. At the end of the room may be seen a little mortar, with the marks of U.S. Philadelphia, 1793, an intimate friend of 'old Mad Anthony' and a most destructive enemy to aborigines. The total number of small arms falls not short of seventy-seven thousand. The other buildings are officers' quarters, barracks, armory, smithy carriage-shop, machine shop with an engine of twelve horse power, paint shops, lead and brass foundries, tin shop, accoutrement shop, and offices. The last named buildings are of brick, with shingle roofs. The yard, with its gravel path-ways and locust trees, is not unlike the garden of the Tuilleries in miniature. In the centre is a cistern or reservoir, intended, with the fire engine, to convey water to any part of the fabric.

3d. The front park presents in view the outside of the main arsenal, with the right and left wings of the commandant's and subalterns' quarters, and is chiefly designed as a grove, to add to the appearance of the 'tout ensemble.' This park is enclosed with iron railings, similar to those around or in front of the President's House, at Washington. After crossing the Butler road, it leads us, 4th, into the upper park, surrounded, likewise, with a permanent wall of stone. In its inclosure are the public stables, (of brick;) three small frame buildings, separated about eighty yards from each other, denominated as the composition, drawing, and preparation rooms, are seen from the road. About two hundred yards in the rear of these buildings is the magazine of powder, designed to contain (environs) one thousand three hundred barrels. The topographical scenery is not surpassed by any west of the Allegeny Mountains, and the climate is salubrious and fruitful.

LAND IN DUTCHESS COUNTY.—We are assured, by a friend, that within the past week, the sum of 100 dollars per acre, was offered for 400 acres of land at Fishkill Hook—an evidence of the high value set on improved farms, in the neighborhood of this great city.

[From the Journal of the Franklin Institute.]

Report to the Board of Directors of Bridges, Public Roads, and Mines, upon the Use of Heated Air in the Iron Works of Scotland and England. By M. DUFRENOY, *Engineer of Mines. Paris*, 1834.

(Continued from Number 11.)

WORKS IN THE ENVIRONS OF GLASGOW.

The vicinity of Glasgow is one vast coal region, the first in Great Britain, both in the extent and the thickness of the veins. This coal basin is also very remarkable for the abundance of its iron ore, both imbedded in the argillaceous schist of the region, and in regular veins, often of considerable extent.

The layers of coal in the vicinity of Glasgow, which belong to the lower strata of the coal formation, alternate with beds of mountain limestone, so that in the same locality are often united the coal, the ore, and flux, and often the fire clay used in the construction of the furnaces.

These invaluable advantages are in part compensated by the enormous loss incident to the carbonization of the coal in this locality, as well as by the lightness of the coke produced. From these circumstances, a ton of iron requires at the Glasgow Works for its production, a much larger quantity of fuel than in any district of England.

The employment of the heated air has produced a revolution in the Scotch works, and enabled them to sustain a competition with those of Wales.

Clyde Iron Works were, as before stated, the first in which the heated air was tried. The apparatus now in use, (see figures 1 and 2,) is composed of a double row of horizontal pipes, a, a, a, a, 150 feet long. These pipes are nineteen inches in diameter, and one inch and a half thick. The exterior row passes behind the furnace, and enters the other row, dividing the air into two parts; so that the blast is carried equally to each tuyere.

The valves placed at E regulate the distribution of air, and stop either branch when repairs are required.

In the length of 150 feet, the tubes pass through five furnaces, or heaters, F, F, F, F, F, of which two are placed near the tuyeres; so that the air has no time to cool before entering the furnace. Figures 1 and 2 give an exact idea of the form and disposition of the five heating fires; they are connected by a conduit of brick, *g*, *g*, *g*, which envelopes the pipes; by this means the flame which escapes from the fireplace circulates about the pipes, and heats their whole length. To preserve the parts of the pipe immediately in contact with the flame, they are encased in fire brick the whole length of the furnace. In the first apparatus of this kind which was constructed, the ends of the pipes were inserted one in the other, having some play to prevent any rupture by expansion; the result was a great loss of air, and the plan was abandoned. Besides, it was remarked that a great waste always took place at the joints of the pipes; so that it was not sufficient to fasten them with bolts and

Figure 1.

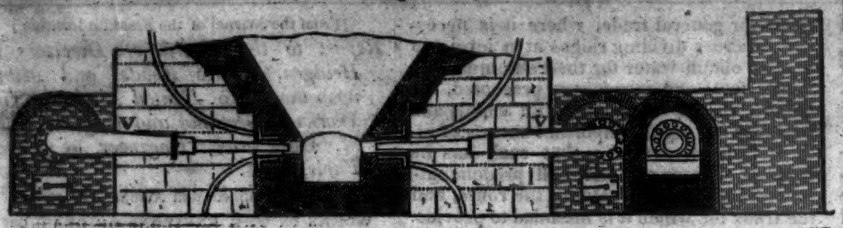
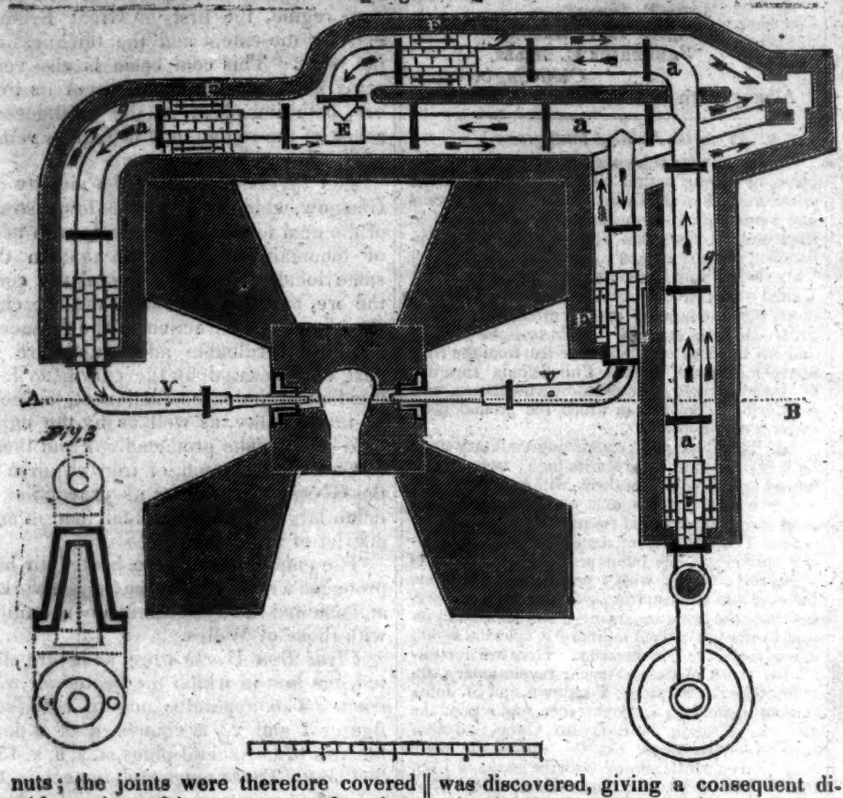


Figure 2.



nuts; the joints were therefore covered with a ring of iron cast on after they were finished. By means of this precaution, the pipes lasted a long time; at the time of my visit, they had been five months in use without repairs.

On the exit pipes are small holes, V, V, by means of which any change of temperature in the air might be ascertained. This precaution is indispensable, because one of the essential conditions in the use of heated air, is, that its temperature be kept uniform—with this apparatus they raised the air to 612° Fahrenheit, which is higher than the melting point of lead.

In the Clyde Works, two of the four furnaces have each an apparatus like the one described, but in the other two there was no room for the extent of pipes, and they are contracted into smaller space, by being doubled upon themselves.

The working of a furnace with heated air requires no particular precaution; the operation is the same as before its introduction, the only difference consisting in the substitution of raw coal for coke. This substitution did not immediately follow the adoption of the new plan; it was some time after, and only when the temperature of the air was raised above the melting point of lead, that the immense benefit of the change was discovered, giving a consequent diminution in the expense of manufacture.

The general idea adopted in Scotland, is, that certain qualities of coal cannot be employed crude, except when the air is highly heated. We have already said that at the Monkland Works, where the air is heated to 460° and 490° Fahr., coke is still used.

The descent of the furnace is very regular—the distances between the charges are nearly equal, the charging being regulated by the space left empty in the throat. The richness of the ore not roasted, varies from 22 to 34 per cent., and the composition of the charges follows this variation. At the time of my visit, the average yield of ore, after roasting, was 44 per cent., and the charges thus composed:

660 lbs. coal,
520 lbs. ore roasted,
100 lbs. lime.

They usually made 40 charges in 24 hours. During the two days that I witnessed the working of the Clyde Works, the number of the charges were,

July 4—from 6, A. M., to 6, P. M., 38
from 6, P. M., to 6, A. M., 39
" 6—from 6, A. M., to 6, P. M., 37
from 6, P. M., to 6, A. M., 40

The yield of the furnace in these four castings, was, 4 t. 8 cwt.; 4 t. 9 cwt.; 4 t. 6 cwt.; 4 t. 12 cwt. Total, 17 t. 15 cwt. for 154 charges; or, 8 t. 17 cwt. 2 qrs. each 24 hours.

This result shows that a ton of iron is produced at an expense of 2 t. 8 cwt. 2 qrs. coal. The consumption of the heating fire is 8 cwt. Total, 2 t. 16 cwt. 2 qrs. per ton of iron.

The castings are made every twelve hours. The metal obtained is usually a mixture of No. 1 and No. 2. That which goes first from the hearth is No. 1. These two varieties of iron are distinguished by the small channels which furrow the surface of the metal while cooling.

The tuyeres are hermetically closed round with clay, and as they cannot resist the elevated temperature to which they are submitted, water tuyeres have been substituted similar to those used in the fineries. The figure 3 represents the tuyeres employed at the Clyde Works; they are of cast iron, and last various lengths of time, averaging five or six months.

The tuyeres are closed in, to prevent the entrance of cold air through the openings. There is no objection to this arrangement, because the air is so hot that no scoria accumulates upon the pipe, and the workmen are never obliged to free the tuyeres. There is a high white heat in this part of the furnace; nevertheless there are scarcely any sparks produced by the oxidation of the iron, and the particles that fall are black in the centre, showing that the metal is still covered with a small layer of melted scoria.

The flame issuing from the furnace is of a bright red, while that from the coke furnace, worked with cold air, is of a yellowish color. This difference of color is as marked as that which exists between the flame of alcohol colored by strontia and by baryta.

The pressure of the blast in the air vessel is two pounds and a half, or five [illegible] of mercury to the square inch. It is [illegible] by the same near the tuyeres, only the gauge which indicates it is subject to great oscillations. This pressure was formerly three pounds. The opening of the tuyere is three inches; it was two inches and a half when cold air was used. The quantity of air forced into the furnace is less. The blowing engine, of seventy horse power, served only three furnaces; now it feeds four with ease. From the dimensions of the blowing cylinder* the quantity of wind, which was 2827 cubic feet per minute of cold air, is now but 2120 cubic feet.

The furnaces of the Clyde have not been altered since the introduction of hot air. They had been in blast a long time when this new plan was adopted; one of them has been seven years in blast, and the regularity of its operations gives an earnest that it will last a long time.

At the commencement of this report, I

* The steam engine which works the blowing apparatus, requires for fuel twenty tons of broken coal, or slack, per day of twenty-four hours, which costs one shilling and eight pence sterling per ton, (forty cents.)

have already stated the economy of fuel, and of flux, which had been obtained at the Clyde Works, by the introduction of hot air. I think it, nevertheless, useful to show the correctness of the estimate by transcribing a statement of the different expenses of manufacture during a month while cold air was used, and a corresponding month, with the use of hot air.

I make this statement from the books of the Works, to which I have been allowed access with a rare liberality.

Consumption and Produce of three Furnaces, using Cold Air and Coke, during the month of February, 1829.

	Coke.	Ore.	Flux.	Pig Iron. No. 1.	Pig Iron. No. 2.	Pig Iron. No. 3.	Castings.	Total.
	t. c.	t. c.	t. c.	t. c.	t. c.	t. c.	t. c.	t. c.
1st week	386	227 9	68 2	72 13	32 13	18 13	1 13	125 12
2d do.	411 10	242 11	72 11	51 19	37 11	47 2	6	136 19
3d do.	401	231 16	70 18	44 16	48 2	38 7	3	131 8
4th do.	301 10	177 13	53 6	53	27 9	26 3	0	105 12
	1500	879 9	264 17	222 8	145 15	130 5	2 2	499 11

Add the consumption of the engine, averaging one ton of slack to the ton of iron made.

Consumption and Produce of four Furnaces, using Hot Air and Coal, during the month of February, 1833.

	Crude Coal.	Ore.	Flux.	Pig Iron. No. 1.	Pig Iron. No. 2.	Pig Iron. No. 3.	Castings.	Total.
	t. c.	t. c.	t. c.	t. c.	t. c.	t. c.		t. c.
1st week	516 15	490 7	91 16	81 4	28 15	155 3	"	265 2
2d do.	514	491 6	91 7	48 8	46 15	161 18	"	257 1
3d do.	521 15	486 8	91 8	94 12	59 10	109 8	"	264
4th do.	470 10	434 12	81 18	75 2	47 10	102 1	"	224 3
	2023	1902 13	356 9	299 6	182 10	528 10		1010 6

The consumption of the steam engine averaged eleven cwt. per ton of iron produced.

The result of an examination of these tables is, that, for one ton of iron produced, there was consumed as follows:—

1829. *With Cold Air and Coke.*	t. cwt.	1833. *Air heated to 612° Fahr. and Crude Coal.*	t. cwt.
1. Coal for fusion—		Crude coal,	2
3 tons of coke, corresponding to coal,	6 15	Do. for steam engine,	11
Do. for steam engine,	1	Do. for heating the air,	8
	7 15		2 19
2. Ore roasted, 3523 lbs., or	1 15	Ore, 3780 lbs., or	1 18
Its average yield being 57 per cent.		Its average yield being 56 per cent.	
3. Flux, 1056 lbs., or	10½	Flux, 704 lbs., or	7
Daily production of furnace, 11,904 lbs., or about 6 tons.		Daily production of furnace, 18,025 lbs., or about 9 tons.	

The daily production having been raised at the Clyde Works from six to nine tons, the introduction of hot air has produced an economy in the consumption of fuel, and in the expense of manual labor.

The following shows the cost of manufacturing pig iron during these two periods:

	In 1829. Cold Air. t. c.	In 1829. Cold Air. d. c.	In 1833. Hot Air. t. c.	In 1833. Hot Air. d. c.
Coal for melting, at 5s. per ton, ($1 20,)	6 13	8 98	2	2 40
Do. for the blowing machine, at 1s. 8d. per ton, (40 cents,)	2	80	11	22
Do. for the heating apparatus,			8	48
Mineral roasted, at 12s. per ton, ($2 88,)	1 15	5 04	1 18	5 47
Flux, at 9s. per ton, ($2 16,)	10	1 08	7	76
Labor, at 10s. per ton, ($2 40,)		2 40		1 60
General expense, interest of capital, 6s., ($1 48,)		1 44		96
Total,		19 74		11 89

Note.—The cost in sterling money is reduced to United States currency, at the rate of four dollars and eighty cents per pound.—[Trans.]

(To be continued.)

Wearing Spectacles.—Mr. Curtis, the celebrated oculist, in a recent publication, is very earnest in teaching the world, that when an individual feels obliged to wear glasses, for the first time, it is immensely important to future vision not to have the spectacle eyes too small. If, says Mr. Curtis, the glasses are not sufficiently large to cover the circle of the orbit, the wearer is obliged to look against the frame, as well as above and below it. The large, old fashioned spectacles, are therefore altogether superior to the modern article: oval bows he condemns in toto, as they exert a destructive influence over the organ, by obliging the whole muscular power of the eye to be exerted, in order to receive impressions through the very contracted window of the bow. He thinks highly of gauze spectacles, as screens to keep out the dust, so terribly destructive to vision in sandy regions and in cities, where the dust is whirled with tremendous violence through the streets, like blowing through so many tubes. He seems to be much opposed to operations on this delicately constructed organ.—[Ibid.]

Henery L. Ellsworth, of Connecticut, has been appointed, by the President, Superintendent of the Patent Office. Mr. E. accepts the office, and has proceeded to Connecticut to remove his family to Washington.—[National Intelligencer.]

Facts from Williams' Annual Register.—There are in the State of New York 56 counties, 781 towns and 9 cities. There are 116 incorporated villages in the State. The incorporated villages are governed by a President and Trustees, generally five in number, who are elected annually by the people. A State census is to be taken this year.—The total number of Post Offices in the State is 1,703. There are 260 newspapers printed in this State, besides several magazines. Papers are published in all the organized counties of the State except Franklin and Putnam. There are 25 daily papers, 15 printed in the city of New York, 3 in Albny, 3 in Troy, 2 in Buffalo, 1 in Brooklyn and 1 in Rochester. In the city of New York there are 65 papers published exclusive of magazines.—15 daily, 11 semi-weekly, 31 weekly, 3 semi-monthly, and 5 monthly. The average circulation of the ten large daily papers is about 1,700, or 17,000 total number of sheets issued daily. The total value of woollens manufactured yearly in this State, exclusive of those made in families, is $2,5000,000. The total value of all manufactures of iron in the State, is estimated at about $4,000,000.

Summary of Canals completed.

Name.	Length.	Cost.	Tolls in 1833
Erie Canal,	264 miles	$9,027,466 05	$1,290,130 20
Champlain Canal	64		
Glen's Fall Feed.	12 —	1,179,871 03	132,539 92
Oswego Canal,	38 —	565,437 35	22,960 47
Cayuga & Seneca Ca.	23 —	236,804 74	17,174 69
Chemung Canal,	23 —	342,133 95	694 00
Navigable Feeder,	16		
Crooked Lake Canal,	8 —	136,331 93	200 00
	546	$11,489,035 99	$1,463,715 28
Navigable Ponds & Feeders,			

Total, 566 miles of canal navigation completed and owned by the State. Average cost per mile, about $21,000

Number of Churches and Meeting Houses in the City of New York.

Presbyterian,	35	Universalist,	3
Episcopalian,	26	Unitarian,	2
Methodist,	20	Independent,	2
Baptist,	17	Jews,	3
Reformed Dutch	15	Moravian	1
Roman Catholic	6	Miscellaneous	4
Friends	5		
Lutheran	2	Total	143

Comparative View of the number of Clergy in the State, in 1819 and 1835.

	No. in 1819.	No. in '35
Presbyterians and Congregationalists,	328	562
Baptist	139	442
Methodists	90	492
Episcopalians	83	191
Reformed Dutch	105	116
Associate Reformed	—	23
Lutherans	16	30
Other denominations, not enumerated in 1819	—	74
	761	1,920

The assessed valuation of personal and real estate in the several counties in the state of New York for the year 1834, is $459,673,135. The to- amount of auction duties for 1834 is $193,470 19. The amount of tolls received from the state canals during 1834 is $1,339,790,56. There are 90 banks in the state, with a capital of $34,781,460. There are 14 marine insurance companies in the city of New York with a capital of $4,550,000, and 29 fire insurance companies, with a capital of $10,-450,000. There are 27 insurance companies in the state exclusive of those in the city of New York, with a capital of $4,501,731. In the state there are five colleges—Columbia College, and the University in the city of New York, Union College in Schenectady, Hamilton College in Oneida, and Geneva College at Geneva, Ontario county.—There are six theological seminaries, one in New York, one at Auburn, Cayuga county, one in Madison connty, one at Hartwick, Otsego county, and one at Cazenovia, Madison county. The arrivals at the port of New York from foreign countries during 1834, were 1,932. During the same year 48,110 passengers arrived at this port from foreign countries. There are 41 whale ships owned in this state, employing a capital of over $1,-000,000, and crews of about 1,000 men.

The number of Attorneys and Counsellors at Law in the state of New York, in 1835, 2052.

The number of Physicians in the state is 2650.

The rank and file of the Militin of this state comprises 186,212 men, viz: horse artillery, 1271; cavalry, 7225 artillery, 11,396; infantry, light infantry, and riflemen, 163,301; fifty companies of artillery attached to infantry permanently, for inspection, 3019.

NEW-YORK AMERICAN.

MAY 16—22, 1835.

LITERARY NOTICES.

THE NEW YORK ANNUAL REGISTER for 1835, by EDWIN WILLIAMS, New-York. This is the sixth year of this useful, improving and annually enlarging publication—and it has now so completely established its character for extent, variety, and accuracy, of information, as to render superfluous any thing, beyond the mention that another volume has appeared, and that it is in every respect equal, and in point of paper and typography, superior, to its predecessors.

THE STRANGER IN AMERICA, or letters to a gentleman in Germany, by FRANCIS LIEBER: 1 vol. 8vo., Phil., CAREY, LEA & BLANCHARD, for sale in New-York by WILEY & LONG. We recently took occasion to copy, from an English Review, a notice of this work of *Dr. Lieber*, and to express our concurrence in the praise there bestowed upon it. We are a queer people—we Americans; we will not buy books about our own country, unless they abuse and caricature us,—nor interest ourselves in the reputation of naturalized citizens—except, indeed, about election time. This book of *Dr. Lieber*, seems to us an illustration of both these remarks. It is certainly clever, agreeable, full of rambling disquisitions, in which there is always a staple of thought and knowledge, and withal, complimentary to Americans, and American Institutions. The writer has taken up his abode among us for good and for evil—he is one of us—and by his labors on that truly national work the *Encyclopedia Americana*, has done not a little to illustrate American literature. Yet these letters to Germany, originally published, under the title, we believe, of letters written during a tour to Niagara, are coldly received; and the praises of which they have been the object in English reviews, are not transplanted, as in the case of every word of eulogy on our native writers, is so eagerly done—into the newspapers of this country. We can assure our readers, nevertheless, they will find that "The Stranger in America" is a very agreeable and well informed companion.

HINTS FOR THE IMPROVEMENT OF EARLY EDUCATION AND NURSERY DISCIPLINE; from the 12th London edition, with additions. 1 vol. 12mo.—*New York*—WILEY & LONG.—The dedication of this work—brief, comprehensive, and speaking—opens its way favorably. It is in these simple but touching words—"Dedicated to Mothers by a Mother;" and well does it redeem the promise of such a dedication, for it is manifestly throughout, the production of a careful, firm, and affectionate mother, who loves her offspring too sincerely, to indulge in the selfishness which so often interferes with proper discipline, and who reverences too much the purity of childhood, to be, in any wise, a party to impairing it, by undue indulgence. Let the following extract show her principles:

Success in Education depends,

FIRST—*More on Prevention than Cure*; more on securing our children from injury, than on forcing upon them what is right. If we wish, for instance, to render a child courageous, we shall effect it not so much by urging and compelling them to feats of hardihood, as by guarding him from all impressions of terror, or from witnessing a weak and cowardly spirit in others.

SECONDLY—*On Example rather than on Precept and Advice.*—As the bodies of children are imperceptibly affected by the air they breathe, so are their minds by the moral atmosphere which surrounds them; that is, the tone of character and general influence of those with whom they live.

THIRDLY—*On forming Habits rather than on inculcating Rules.*—It is little to tell a child what to do; we must show him how to do it, and see that it is done. It is nothing to enact laws, if we do not take care that they are put into practice, and adopted as habits. This is the chief business of education, and the most neglected; for it is more easy to command, than to teach and enforce. For example; a child will never know how to write by a set of rules, however complete, the pen must be put into his haud, and the power acquired by repeated efforts, and continued practice.

FOURTHLY—*On regulating our Conduct, with reference to the Formation of the Character when matured, rather than by confining our Views to the immediate effect of our labor.*—Premature acquirements, premature quickness of mind, premature feeling, and even premature propriety of conduct, are not often the evidences of real strength of character, and are rarely followed by corresponding fruits in future life.

LASTLY—*On bearing in mind a just sense of the Comparative Importance of the objects at which we aim.*—As in the general conduct of life, it is the part of wisdom to sacrifice the less to the greater good, so is this eminently the case in the subject before us. Now the primary, the essential object of education is this—to form in children a religious habit of mind, founded on the divine principles of Christianity, and leading to the habitual exercise of practical virtue. To this, all other attainments are wholly subordinate.

THIRTY YEARS CORRESPONDENCE BETWEEN BISHOP JEBB AND ALEX. KNOX. 2 vols. 8vo. Edited by the Rev. CHARLES FORSTER, formerly domestic chaplain to Bishop Jebb. Philadelphia. CAREY, LEA & BLANCHARD. For sale in N. York by WILEY & LONG.—A correspondence through the space of nearly the third of a century, between two men of warm attachment to each other—in the most unreserved confidence—and discussing matters of taste, literature, but mainly religion, with open hearts and minds, could not fail—even if the writers were only men of ordinary capacity—to be a record of deep interest and attraction. But here the parties are profound scholars—admirable writers—discriminating critics: add to to this, the charm of feeling that what you read in these letters, is the honest outpouring of one tried friend to another—not written for effect—not dreaming of future publication, as Lord Byron, in all his letters to Murray and others, so manifestly was—but written as the friends would have talked, if together, in the fulness of their understanding and their hearts.

The general and most frequent topics of the letters is, of course—religion—and the various duties enjoined upon Mr. Jebb by his different stations in the church, first as Curate, at 50*l.* a year, till he rose to the Bishopric of Limerick. There is, moreover, a great deal that all readers of taste will be interested in—so, at least, we feel quite authorized in pronouncing, from the casual and interrupted perusal we have been able to give to these volumes.

THE INFIDEL OR THE FALL OF MEXICO: A ROMANCE, BY THE AUTHOR OF CALAVAR, 2 vols. PHILADELPHIA, CAREY, LEA & BLANCHARD. We have read these volumes through with unwavering interest; they evince power of a high order, and thorough preparation for the work undertaken. They embody the very spirit of the times in which the story is laid, and reproduce the men and the scene, as though they were living before our eyes. The faults of the work indeed, as they strike us, are superabundance of incident and detail, arising however from a richly stored mind.

The story is that of the fall of the island empire of the city of Mexico, after the long and bloody operations against it conducted by *Cortes* in person, and the gallant, protracted, but eventually unavailing defence of the youthful and ill fated Guatimozin. The hero of the story, however, is *Juan Lerma*; the heroine, a very remarkable creation, *La Monjenaza*; and not least, the noble dog *Bero*—a type not overdrawn, of the incorruptible fidelity, and courageous affection, of that truest of the friends of man—among the brute creation—and hardly limited to that.

THE AMERICAN MONTHLY, for May: New-York, D. K. MINOR.

THE KNICKERBOCKER for May: New-York, WILEY & LONG.

THE TURF REGISTER, for May: Baltimore, I. SKINNER.

We have only had time to skim over the pages of the Monthlies,—but found wherewithal to be well pleased. There is in the American Monthly, both variety and ability.

NATIONAL ACADEMY OF DESIGN; 10th Annual Exhibition.—We conclude our Review to-day, with a notice of a portion of the pictures in this exhibition, which, as a whole, is creditable, though we are by no means a convert to the opinion expressed by some knowing members of Congress, in the debate respecting the vacant pannels in the Capitol, that in this country painters in all the highest departments, are plenty as blackberries.

SUMMARY.

The annexed Acts are of general interest:

An Act relating to the privileges of Firemen of the respective cities within this State, passed May 8th, 1835.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

§ 1. The firemen of the different cities within this State, in case of removal from one city to another, shall be allowed the time which they may have served as such firemen in the city they left, in the city to which they removed, upon producing a certificate of such service, signed by the chief engineer of the city so left, and being reappointed a fireman in the city to which they have removed.

§ 2. When every such fireman shall have served as such for so long a time thereafter as shall make the whole term of service the same as required by the law of Firemen residing in the city removed to, they shall be entitled to all the privileges and exemptions now secured by law to the firemen of the cities of Albany and New York.

An act in relation to the assessment of highway labor. Passed April 24, 1835.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

§ 1. The real property of non-resident owners, improved or occupied by a servant or agent, shall be subject to assessment of highway labor, and at the same rate as the real property of resident owners.

§ 2. The twenty-second section of title first, chap. 16th, part first, article second of the Revised Statutes, shall be amended so as to read as follows:

"§ 22. The commissioners of highways in each town, at their first or any subsequent meeting, shall make out a list and statement of the contents of all lots, pieces or parcels of land within such town, owned by non-residents therein; every lot so designated shall be described in the same manner as is required from assessors, and its value shall be set down opposite to such description; such value shall be the same as was affixed to such lot in the last assessment roll of the town; and if such lot was not separately valued in such roll, then in proportion to the valuation which shall have been affixed to the whole tract of which such lot shall be a part.

§ 3. The twenty-fourth section of the same chapter shall be amended so as to read as follows:

"§ 24. In making such estimate and assessment the commissioners shall proceed as follows:

1. The whole number of days' work to be assessed in each year shall be ascertained, and shall be at least three times the number of taxable inhabitants in such town:

2. Every male inhabitant being above the age of twenty-one years, (excepting ministers of the gospel and priests of every denomination, paupers, and idiots and lunatics,) shall be assessed at least one day.

3. The residue of such days' work shall be apportioned upon the estate, real and personal, of

every inhabitant of such town, as the same shall appear by the last assessment roll of the said town, and upon each tract or parcel of land, of which the owners are non-residents, contained in the list made as aforesaid.

4. If, after such appointment, there shall be any deficiency in the number of days' work determined by the commissioners to be performed in their town, the then ensuing year, such deficiency shall be assessed upon the estates, real and personal, of the inhabitants of the town, and upon each tract or parcel of land of which the owners are non-residents, according to the last assessment roll.

5. The commissioners shall affix to the name of each person named in the list furnished by the overseers, and also to the description of each tract or parcel of land contained in the list prepared by them of non-resident lands, the number of days which such person or tract shall be assessed for highway labor, as herein directed, and the commissioners shall subscribe such lists and file them with the town clerk."

THE MICHIGAN WAR SUSPENDED.—The Buffalo Commercial Advertiser of the evening of the 11th, has this paragraph:

Messrs. Rush and Howard, who have been acting as Mediators between Ohio and Michigan, left this city yesterday, on their return to Washington. We learn from them the important fact, that Gov. Lucas with his suite, and the militia who were assembled at Perrysburgh, have returned to their respective homes.

The Commissioners for running the northern boundary line of Ohio, have also returned, and will suspend their operations until after the meeting of the Ohio Legislature in June, a special session of which, at that time, has been called by Governor Lucas.

We are much gratified to have it in our power thus to assure our readers, from an official source, that no further difficulties need be apprehended between the two Great Powers—in Cabinet parlance—for some months, at least.

[*From the Baltimore Patriot.*]

BALTIMORE PROSPECTS.—We mentioned, a few days since, a purchase of a large square of ground in the eastern section of the city, by speculators from abroad. We have now to notice the purchase of the country residence of the late Mr. Didier, within the western limits of the city, about 19 acres, for $24,000, by a citizen of New York, who has bought, also, a square of ground between German and Pratt streets. It is believed he will more than double his money within a short period. Capitalists can no where make more profitable investments than in Baltimore, at the present [illegible] the city is destined to "go ahead" steadily, [illegible] pidly.

STEAMBOAT EXPLOSIONS.—The National Intelligencer, adverting to the frequency, and fatality, of these occurrences, says very justly:

"There is no certain remedy for these accidents but to make the owners of the boats sweat for them. A penalty of $5,000 for the death, and $1,000 for the damage of every individual, caused by the bursting of boilers, would soon put a stop to such occurrences, for they are all the result of negligence, incapacity, or culpable mismanagement."

THE GRAIN AND FLOUR MARKET.—The price of Grain and Flour as a more general concern than that of any other articles of merchandise,—for we all eat bread—naturally attracts attention—just now. It is, we observe, said in some of the Southern papers, that the rise here in these articles, is probably speculative, and partaking of the gambling spirit, which the rise in Stocks and Real Estate, is supposed to exhibit.

According to letters however, we have seen today, from the grain growing region of this State, we apprehend there is really too good ground for the rise, in the shortness of the supply left over from last year, and in the injury which the severe winter has done to the wheat in the ground. At any rate, $1 25 was *refused* at Geneseo, last week, (on the 9th,) for wheat.

Fodder for cattle is also fearfully scarce, Many head have perished, and at Rochester hay has been sold at $30 per ton. Even at the Genesee Flats it commands $14—and in many places, farmers are doling out with a scanty hand to their cattle, the wheat which was reserved for their own use.

The New York spirit of speculation seems to find itself too much circumscribed within the narrow limits of this city and its vicinity, and is extending itself, as will be seen by the annexed paragraph, to Albany, and even to Baltimore.

[*From the Albany Argus.*]

REAL ESTATE SALES IN THE CITY OF ALBANY.—The recent sales of real estate in this city, although extending in the aggregate to a large amount, are by no means in advance of the actual value of property.

The sale of the extensive and valuable estate of Mr. E. C. Delevan, for some $250,000, is a purchase that promises to return ultimately, if not immediately, a large profit to the company into whose hands it has fallen. During the past and previous year, real property in this city has not advanced in value with the progress of population and the upward tendency of rents. It may be said to have been stationary. It could not be doubted, however, that the increasing business of the city, the multiplied travel and intercourse, and particularly the prospect of the removal of the obstructions to the navigation, would give an impetus to real property. It was obvious that it would start forward as soon as these combined causes should become in any degree operative. And such has been the case. The purchase of this large estate was made just at the turning point, and will scarcely fail to prove advantageous to the new owners and to the city. The south lots alone must be soon worth the entire purchase money.

The purchase of the property of Jas. Stevenson, Esq., for $42,000 was also judiciously made. It is in the heart of the city, and among the most valuable real estate on State street. We suspect that more than one of our citizens would be glad to take the property at the price paid by the New York purchasers.

Other sales of lots and property in the city indicate a decidedly upward tendency in value and demand.

GREAT SALE OF REAL ESTATE.—The Country Seat of Com. Chauncey near Hellgate, which was sold by the Commodore a few months ago for fifty thousand dollars, was re-sold in *city lots* yesterday, for nearly one hundred and twenty thousand dollars.

It is distant about five miles from the City Hall, and contains about 15 acres, we believe.

STEAMBOAT CASE—A POINT TO BE MOOTED.—It is stated in the Richmond Whig, that the steamboat *Columbian*, plying between Baltimore and Norfolk, on a recent occasion, meeting on her way up, off the mouth of the James River, a new boat, the *Thos. Jefferson*, built to run between Richmond and Norfolk, refused to receive on board—as was usual, and as had been done we presume hundreds of times, from other boats belonging to the same parties as the Columbian—passengers bound to Baltimore. The objection was, not want of room, nor stress of weather, which prevented the boats coming to, with safety—for the passengers from the *Thos. Jefferson* were alongside the Columbian—but that they were from a rival boat. They were accordingly driven back.

Now the point we desire to moot is, whether—if in virtue of advertisements, or common usage, the Columbian was known, and relied upon, to take passengers from the Richmond boats when meeting between Norfolk and the mouth of the James River—there would not lie an action against the proprietors, or master, for breach of contract, in the case referred to by the Whig?

They who undertake for hire, to run public conveyances, whether on land or water, do contract engagements towards the public, from which they should not be, and we presume are not, at liberty, from any capricious, or selfish, or spiteful motives, to exonerate themselves, without due notice. While they are common carriers of goods or passengers, they must abide by their own undertaking, or be subject to penalty for not doing so. This, at least, is the common sense view of the case, and therefore possibly the common law—though between common sense and law there be, sometimes, sad discrepancies.

Pennsylvania Loan.—The loan of $3959,600, authorized by an act of the last session of the Legislature, and for which proposals were received at the Office of the Secretary of the Commonwealth until the 9th inst., was taken by Elihu Chauncey, Esq., for the Bank of Pennsylvania, at *one hundred and twelve dollars and two cents* for every one hundred dollars of stock. We understand that the Messrs. Phillips bid $111 74.—[U. S. Gazette.]

[*From the Globe of Yesterday*]

The following gentlemen have been invited by the Secretary of War to attend the next General Annual Examination of the Cadets of the Military Academy, which will commence on the first Monday in June:

Maine.—Hon. M. Mason.
New Hampshire.—Col. S. Collins.
Massachusetts.—*Hon. N. Bowditch.
Connecticut.—Rev. J. Cogswell, *Rev. H. Croswell.
New York.—Hon. B. Green, Hon. C. C. Ferris, Gen. Geo. R. Davis, *George W. Clinton, Esq., John Hunter, Esq.
Pennsylvania.—Dr. C. D. Meigs, Gen. W. S. Rogers, Wm. Robinson, Jr., Esq. Wm. J. Leiper, Esq., Wm. C. Frazer, Esq., *Hon. Geo. M. Dallas, Hon. Calvin Blythe.
Virginia.—Dr. E. H. Carmicheal, Col. John Heth, Hon. P. V. Daniel.
North Carolina.—John Bragg, Esq.
South Carolina.—Dr. E. S. Davis.
Georgia.—Col. Wm. C. Lyman.
Kentucky,—Thomas J. Pew, Esq.
Tennessee.—Right Rev. J. H. Otey, Bishop of Tennessee.
Indiana.—*Dr. E. Newlanid.
Alabama.—Col. Peter Martin.
Army.—Brig. Gen. Henry Atkinson.

*Those gentlemen who have this mark before their names have declined.

[*Hudson's News Room Correspondence.*]

STEAM BOAT DISASTER.—The Steamboat William Parsons, on her passage from New Orleans to Little Rock, was snagg'd and sunk, in Arkansas river, about 40 miles above port Arkansas. She had a cargo worth about $60,000, fully insured; part of it has been saved in a damaged state. No insurance on the boat, which, it is supposed will be lost.

The Brig Maese, hence for Sisal, is ashore at Barnegat, and will probably be lost.

[*From the Nat. Gazette.*]

The annexed article is "going the rounds" of the newspapers.

"An English paper speaking of honor, the soreness of which, it says, is betrayed by the sensitiveness, makes this just remark: 'The common sense of mankind instructs them that a sound robust honor is never touchy; it is when it becomes weak and tender that it goes about querulously asking this man and that man whether they intended to hurt or offend it.'"

Neither the common sense nor common experience of mankind warrants this theory, supposing *touchy* to mean sensitive. The most pure and delicate—those who have labored most earnestly to deserve the best reputation—are apt to be "tremulously alive" to every kind of obloquy or injurious suspicion. Honor may be thoroughly sound and incorruptible, but not *robust* so as to be unaffected by opinion. Falsehood alone can annoy it, and does severely in the plurality of cases. There are, indeed, public purs ts and situations, so particularly and constantly able to obloquy, that the natural susceptibility of true honor is gradually lessened; yet, eminent men of the noblest virtue, public and private, have even perished, in advanced stages, from tenderness or irritability with regard to their fame. Few are content or able to live down merely the judgments of ignorance and the inventions of malice." Querulousness, indeed, is never manly, and rarely serviceable; but sensitive

ness is common where firm, conscious honor and high moral courage are united. On this account slander is doubly mischievous and detestable.

THE HONORED CHIEF JUSTICE.—The National Intelligencer of yesterday, referring to the rumors of the ill-health of Chief Justice Marshall, has this cheering paragraph:

We are happy to say that a letter from the Chief Justice, upon business, was *yesterday* received at the office of the National Intelligencer, the contents and appearance of which indicate nothing like indisposition of either mind, or body, in the writer. The hand is as firm, and matter as germain to the purpose, as usual with him. Furthermore, the Richmond Compiler of Friday last states, that the Editor saw the Chief Justice on the previous day, taking his accustomed walk, half a mile distant from his residence.

The funeral ceremonies yesterday, in honor of the late General Leavenworth, were altogether creditable to the feelings of the city, and to the arrangements and precision of the military. The day was hot, but fine, and the crowd of spectators great.

The Journal of Commerce gives these particulars:

The Superior Court room was reserved for the Judges of the Law Courts, Members of Congress, and State Legislatures, Society of Cincinnati, &c. The Common Council room was reserved for the reception of the Common Council, Clergy, Pall bearers, Officers of the Army, Recorder, Ex-Mayors and Recorders, Ex-Aldermen and Assistants, and the Corporation of Brooklyn. The remains of the deceased lay in state in the Governor's room. On the plate of the Coffin, which was a very superb one, was engraved the words, "BRIGADIER GENERAL HENRY LEAVENWORTH, DIED, JULY 21ST, 1834, AGED 51 YEARS." About 4 o'clock the funeral procession left the City Hall, and proceeded to the Steamboat, amidst discharges of cannon. The following is a brief memoir of the deceased, for which we are indebted to the kindness of one of his relations.

General Leavenworth was born in the State of Vermont, and in the year 1806 came to the town of Delhi, in Delaware Co., N. Y., where he studied law under General Root, and continued practising it until the year 1812, when he entered the army as a Captain, at the head of a volunteer corps which he raised himself, and from that period till his death he remained in the army. He commanded a battalion in the 9th regiment at the battles of Chippewa and Bridgewater. After the first of these battles, he was made Lieutenant Colonel, and after the second, where he particularly distinguished himself for his gallantry, he was made Colonel. At this battle most of the officers were wounded, and for a part of the day nearly the entire command devolved upon him. He was however at last wounded himself. Whilst he was holding out his arm pointing towards the enemy, a cannon ball struck his arm and knocked him off his horse. After the battle, he retired to Delhi, where he remained five or six months, and then rejoined the army. When peace took place, he was appointed to the command of Sackett's Harbor, and was subsequently stationed at Jefferson barracks, a little below St. Louis on the Mississippi, afterwards at the Falls of St. Anthony on the Mississippi, and other outposts, until the summer of 1834, when he marched in command of the dragoons, on an expedition to the settlements of the Pawnee and Camanche Indians. This was unfortunately his last campaign; he died on the 24th of July, 1834, of fever, at a place called Cross Timbers, on the False Washita. His remains were at first taken to Cantonment Jesaup, and from thence to New Orleans, from which place they were shipped for this port about six weeks ago. Prior to the shipment the flesh was separated from the bones and nothing but the latter was brought here. They arrived a few days since, and were yesterday put on board a steamboat, to be conveyed to Delhi, where his wife, who died in 1811, lies interred.—She was the sister of Doctor Knapp of this city. In all his different relations in life he sustained the character of a brave, amiable, intelligent and highly honorable man.

MISSIONARIES.—The ship Shepherdess, which has sailed from Boston for India, has on board the Rev. John M. S. Perry and lady, of Mendon Massachusetts, and Rev. J. J. Lawrence and lady, of Gennessee, New York, destined for Ceylon; Rev. Henry Ballentine and lady, of Marion, Ohio, and Mr. E. A. Webster (Printer) and lady, from Utica, New York, destined to Bombay—all sent out by the American Board of Missions.

BALTIMORE, May 13.—*Naval.*—The Board for the examination of Midshipmen, consisting of Captains Ballard, Dallas, Bolton, Claxton, and Kearney, convened yesterday, in this city. Between forty and fifty Midshipmen have reported themselves, prepared for the ordeal, and, with good wishes for their success, we bid a "pleasant passage."—[Patriot.]

The Astor Hotel, N. York.—The Boston Atlas says, that this House has been taken by the Messrs. Bovden, of the Tremont House, Boston.

Shocking Accident.—We learn that as the Northern Stage was passing over Culpepper's Bridge, between Halifax and Louisburg, on Saturday last, on its route to this city, the feet of one of the horses got caught in a hole, which so alarmed the others that they started to runand upset the Coach. Several of the passengera were seriously injured. One had his back broken, and, it is said, cannot possibly survive; the driver also, we are informed, was in a dying state. Two or three of the horses were either killed or drowned. These are all the particulars we have been able to glean. —[Raleigh Reg., 12th May.]

Capt. Douglas, (of brig Elm, from Guayama, P. R.) was informed by the Am. Consul, and his merchants at Guayama, that there was a report that 14 plantations at Santa Croix had been destroyed by fire.

In a short time will be published, by Messrs. Carey, Lea & Blanchard, "The Conquest of Florida, by Hernando Soto," a work in two volumes, derived from original and authentic chronicles, by Theodore Irving, Esq. the nephew of Washington Irving.—We congratulate the author upon the success of this his first attempt to follow in the footsteps of his distinguished uncle. It furnishes conclusive evidence that he will do no discredit to his name, and that we may expect much from his devotion to literary pursuits. The subject is one of considerable interest both from its historical importance, and its romantic character, and is treated in a way that cannot fail to engage the attention of every reader. The dedication to the author's uncle, does equal honor to his head and heart.—[Nat. Gazette.]

Navigator Islands.—This group lies in about 13 sout latitude, and 171 West longitude. Captain Worth, of the Howard, informs us, that having visited most of the islands in the South Pacific, he considers the Island of Oteewhy as presenting advantages and facilities to whalemen, superior to those of any other island in that Ocean. It affords fruit, yams, poultry, swine, &c. in the greatest abundance; plenty of wood, and excellent water. For a musket the natives give 13 hogs, or 800 to 1000 yams; and great quantities of fowls, cocoanuts, bananas &c. may be purchased for a few pipes, flints, and blue glass beads. The fruit is generally obtained at the N. W. part of the island; but hogs, wood and water are procured from the north side.—Sufficient supplies may be taken on board in the short space of four days; and no danger need be apprehended from the natives, provided the precaution be taken to keep the head chief on board as a hostage, day and night—a requisition very willingly complied with when two or three of the natives, and an interpreter, are also allowed to remain. By pursuing this course in both of his visits to this place, Capt. W. passed and repassed unarmed in his boats with perfect safety, and found the natives extremely civil, never attempting to steal from the boats on shore, nor while on board his ship. He thinks however, that without this precaution, they would *not* hesitate to seize a boat and crew, merely for the sake of two or three muskets—which article they seem very anxious to obtain, though they never inquired for shot or ball. The white residents (of whom there are only two, who are chiefly engaged in agriculture) informed Capt. W. that they made no other use of the muskets than to discharge them at their great feasts —considering those the best which made the loudest reports!—[Nantucket Enquirer.]

Bonin Islands.—These Islands are about midway between the Ladrones, and the coast of Japan —say lat 27 N., lon. 143 E.—Plentiful supplies of yams, potatoes, corn, hogs, water and wood—together with fine green turtle, weighing from 400 to 600 pounds each, may here be procured. The ship Howard, during her recent voyage, cruised several weeks in the vicinity, between the 25th April and 8th June last, and obtained considerable oil, though the weather was unfavorable most of the time. Great numbers of whales were seen during this period. The H. took on board 40 bbls yams, and 30 do potatoes—also, from the South Island, 38 large turtle. There are at the North Island, on the western side, some thirty inhabitants consisting of five industrious white men, and 20 to 25 men and women from the Sandwich Isle.—These settled there in 1828, and have cleared about 1000 acres of land—the soil of excellent quality —though in the months of April and May their plantations suffer much from the heavy rains. At the date above mentioned, they had on hand about 1000 bbls yams and as many bushels of good corn, ready for disposal to such vessels as might call for recruits, and at prices similar to those of the Sandwich Islands.

This island (the North Island) affords one of the best harbors in that ocean. Supplies may be obtained by lying off and on; but near the shores of each island there are strong currents setting in various directions. A ship can stand into the south island, send her boats on shore, and in two hours they can return, each bringing five turtle, being as many as a boat can float with. For the prevention of scurvy, a fresh stock of vegetables of almost every kind, and abundance of the finest melons, may be obtained in the months of June and July—being a convenient time for the ships in that region, as the whaling seasons on the coast of Japan grows later every year.

Capt. Worth, from whom we derive the above details, is of opinion that an error exists in the location of these islands as laid down on most charts. From his observations, carefully and repeatedly taken, he judges them to be at least 30 miles South, and 70 miles East, of their places on the charts. On comparing his observations with those of several other shipmasters who were there at or about the same time, he came to the same result.—[Nantucket Enquirer.]

THE WEST INDIA EXPERIMENT.—The Gazette, of this morning, publishes a letter from the Island of Jamaica, of the 18th ult., which, after acknowledging the receipt of some newspapers from this city, gives this encouraging account of the conduct of the emancipated slaves in that island.

"... observe some of them are very incorrect re... the conduct of the negroes, and the aspect ... country in general; by those representations it would appear, that the Island was all in confusion—the estates and plantations all destroyed—horror and dismay staring us in the face, dreading butchery and bloodshed at every step—but I am happy to say, it is not only far, but *altogether* otherwise. We are *all*, God be praised, quite well and happy,—my negroes conducting themselves with every propriety and decorum, and I never had less trouble with, or more work done by, them."

The Canton (Chinese) Register says—

"Of all the frontier parts of the Chinese empire, the coast is, perhaps, in the most defenceless state. An inefficient navy with dismantled forts can afford little protection. From the Choo-keang (Pearl river) of Canton to the frontiers of Mantchooria there are numerous navigable rivers which lead to the most flourishing cities of the empire; spacious harbors to contain whole fleets, and water communication by means of canals to the most distant parts of the empire. They cannot be ignorant that six provinces are assailable, and that the most important parts of the empire lie open to the grasp of a superior maritime power. If the government officers therefore tremble at the sole thought of irritating a foreign power, which has the means of punishing their arrogance, we must not consider their fear unfounded. They may have recourse to haughty edicts and a show of power; but when all stratagems and expedients are exhausted, they will sue for peace as humbly from, as they formerly, in the height of pride, announced their decrees to, the barbarians."

[*From the N. Y. American.*]

ARTIFICIAL MARBLE OR STONE COFFINS.

We some time since alluded to the fact of Parker's cement having been proposed to be applied to the making of coffins. We have since had an interview with Mr. White, one of the gentlemen who have obtained a patent for this novel species of manufacture. Mr. White has left a sample of the cement thus prepared, at our office, where the curious may call and see it. It is certainly another extraordinary evidence of the success and rapidity with which the inventive genius of our countrymen strikes out new paths and new discoveries in the arts, while the older nations of the earth are creeping behind us at the slow and crawling pace of the snail or sloth. The sample of cement in question is almost two thirds of an inch in thickness, solid and hard, yet light in its texture, and on the outside polished, and afterwards varnished of a dark walnut color.—This glazing or varnish, Mr. White informs us, may be made, as we suggested to him, in imitation of mahogany, maple, rose, or any other elegant wood. The coffins, it is presumed, are to be made with the lids separate. After the body is placed in it, a thickness of cement is to be laid on the edge of the coffin, to connect the lid, leaving a small opening, to be used temporarily until the air is exhausted by a receiver. This opening also being filled in, the whole is perfectly air and water-tight. The interior being deprived of air, decomposition of the body, and the breeding of those germs of insects which are supposed to be inherent in our flesh, cannot, of course, go on, and must be suspended. We know how deeply interesting this subject is to the feelings of the world, and how few there are so callous as not to wish to preserve unaltered, after death, "this sensible warm being," and still to gaze on its cold tenement as the silent but eloquent image of the spirit that once animated it, and which we know may be effected, by exclusion from air and moisture, from the opening of the leaden coffin of the unfortunate Charles I. during the time, and in the presence, of Geo. IV. Though two centuries had elapsed from his death, the very color of the complexion, and the pleasant smile of the features, were the same as in the best portrait of him taken at the time, from life, by the celebrated Vandyke. The Egyptians, deprived of convenient burial places by the inundations of the Nile, and admonished by their belief in transmigration, resorted to embalmment. Catacombs and pyramids were built in honor of the dead, whom they respected more than the living.—The invention of which we speak far excels this complicated process, and we doubt not it will be entirely substituted for destructible wood, and come into general use, not only for coffins, but for all kinds of vessels and receptacles in which it is desirable to preserve the contents from dampness or the external air—thus, for records, public documents, books transported to great distances over the sea, &c. It is also proper to add that, in these air-tight coffins, Mr. White proposes to insert in the lid, over the face of the corpse, a thick plate of transparent glass, while the cement is soft, and which thus, on hardening, becomes a part of the lid. Thus, the friends and relatives of the deceased may here view, after death, at their discretion, the revered face itself on which they doted, in life, with a parent's devotion, a brother's affection, or a sister's love.—In fact, not only might the body be thus visited in its vault, but, so far as its freedom from taint is concerned, might be kept in the residence of the living. If buried, the grave need not be deeper than the surface.

Mr. White, and Doctors Hoyt and Dayton, of Syracuse, are owners of this improvement.

Mr. White is joint owner with Mr. Parker in the cisterns of this material, and some other improvements. Those going into either branch, would find their interest, therefore, in the opportunity of embracing the whole. Will not undertakers, as a matter of interest, be disposed to adopt the stone coffins at once, in preference to those of wood?

We take the above extract from the "Star"—embodying many of the considerations in favor of these coffins. We, however, shall speak further on this subject, and in relation to the immense value of this cement generally, as soon as our time will permit. One of the proprietors, Mr. White, (who can be found at Howard's Exchange, or at the Office of the American Cement Company, Broad street, New York,) has exhibited to us a specimen of the coffin spoken of, which embraces all qualities of safety, duration and imperviousness to air and water—and is not, withal, much heavier than the heavier woods.

The material is one, which must, as it strikes us, come into very general use for cisterns, &c.

Exquisite Art.—It is generally urged as a reproach to the works of art, as contradistinguished from those of nature, that they cannot bear the scrutiny of microscopic examination. Mr. Charles Toppan, of the house of Draper, Toppan, Longacre & Co., of Philadelphia, has, however, produced a specimen of attenuated workmanship, that not only challenges this test, but is absolutely inaccessible to any other. With a degree of minuteness, scarcely conceivable by the uninitiated, and not easily rendered credible even to the artist, he has contrived to engrave, beautifully and distinctly, the whole of the Lord's Prayer and the Ten Commandments, in the area of a circle only three-eighths of an inch in diameter. In this version—which is precisely that of the Episcopal Church, except that he has accidentally added the word *done*, and repeated the word *him*—there are no less than fifteen hundred and nine letters and figures. The space occupied, is one-tenth of a square inch; and the whole Bible, printed in a character equally minute, would only cover a space of seventeen inches square. This may seem incredible; but as a square inch, by accurate calculation, will include fifteen thousand of Mr. Toppan's letters, 263 square inches will include all the letters in the Bible. The Lord's Prayer forms only one-fifth part of this little wonder, and occupies a space less than one-fifteenth the size of an average sixpenny piece—so that instead of *one* copy of this prayer within the compass of a sixpence, Mr. Toppan's graver would produce fifteen. I have seen the Prayer and Ten Commandments, copied from Mr. Toppan's version, covering a circle of five inches in diameter; it contained, as his does, thirty-eight lines, and was in a character quite as minute as it could be, and continue pleasantly legible by the naked eye, and yet each letter occupied as much space as one hundred and sixty-six of Mr. Toppan's. Can there be a greater security against counterfeits than the exquisite skill of such an artist? N. W.

We have seen the very extraordinary specimen of minute engraving above referred to—and certainly, nothing but the evidence of our own senses could have satisfied us, of its perfect distinctness, and beauty, of execution.—[Ed. N. Y. Am.]

Mr. Whittemore's Cotton Gin.—We had the opportunity this morning of inspecting Mr. Whittemore's Gin for Long Staple Cotton. Mr. W. after several attempts has at length brought his Gin to that state of improvement, that leaves nothing to be desired. The little space occupied by it, the ease and rapidity with which it is propelled, the economy of its cost, its little liability to injury, and the facility with which the wear and tear to which it is incident may be repaired, will render it a great acquisition to the Sea Island Planter.—[Charleston Patriot.]

Niagara Hose Company, No. 2.—We called yesterday afternoon, to view the new carriage of this company, which is well worthy of notice, being incomparably superior in point of splendor to any we have yet seen, and excelling by far in regard to taste and richness af embellishment, any hose carriage in the city. It was built at the Corporation yard, at a cost of nearly $4000, including the hose, which is 800 feet in length, being longer by 600 feet than the hose of most of the other companies. The silver plating was done by John Boardman, 249 William street; the boxes were painted by John Quidor, 46 Canal street, who certainly deserves great credit for the performance, exhibiting as it does the hand of an accomplished artist;—the carving, painting, and bronzing, is the work of Messrs. Boeckel & Moriarty, 34 Canal street, and entitle these gentlemen to much praise, too;—the leader-jacket, is the work of Messrs. Wilson & Roberts, 131 Bowery—the carving by Watkins & Barry, Chatham-square. The cost of ornamenting was about $1000; defrayed, of course, by the individuals composing this enterprising and spirited company.—[Mercantile Adv.]

This year has been more than usually fatal to the *Moose Deer*. The Loretto Indians have killed about thirty this spring, and probably an equal number has been killed by other hunters. The deep falls of snow, and the prolonged frosts of the spring which form a crust on its surface, afford a very favorable condition of things for this description of deer hunting, which is probably peculiar to North America. The Moose has a loose hoof, not spreading like that of the Rein Deer, it consequently sinks to the ground at every footstep. In the fall, the brood choose their beat where the shoots of their favorite trees are most abundant, and treading the snow at each fall, they manage to pass the winter, if undisturbed. The parties who seek them, first find their beat, and if the crust and snow are favorable, they start the deer and pursue them on snow shoes. The exceedingly timid animal, first rushing off with a strong and bold full speed, soon flags, and a couple of miles, or rather more, according to the state of the snow, brings up his pursuers, to despatch him with a gun, or to cut the sinews of his hind legs with the tomahawk. Its senses of smelling and hearing are exceedingly acute, and it is almost impossible to surprise it, but it easily thus falls overpowered by its own struggles, claiming the pity of its pursuer with a submission so unresisting, that it sometimes draws a tear even from the savage.

A Man lost overboard.—Extract of a letter from on board the United States ship Constitution:—

Four days out, as I was standing at the galley listening at the dash of the waves against the bridle ports, and watching the foaming flood that poured across the gun deck, I heard an unusual stir upon deck, and presently the cry of "a man overboard" was echoed throughout the ship.

It appears that the poor fellow was stationed upon the mainyard, and that in endeavoring to toggle the maintop bow line, he was struck by the flap of the sail and knocked overboard. The life buoy was cut adrift, the ship hove to, and the boat lowered as soon as posible, but alas! He gained the buoy worn out with his extraordinary exertions, gave it one slight grasp, and then went down to rise no more. And shall no one trace the epitaph of the seaman lost in the discharge of his duty? Shall the wild blast and the stormy petral alone sing his requiem when the storm-cloud settles, and

"The Ocean leaps to own its God."

No! heaven forbid, the white stone shall yet rise in the corner of the village church yard in remembrance of him; and the aged mother as she stoops beneath the waving willow and reads—"Sacred to the memory of William Shaw, seaman, lost at sea,"—shall shed the tear of maternal sorrow there; and the young widow shall keep green the sod that covers the ideal grave of him, whose return she long expected when a foot trod heavily upon the threshold; or a voice unusual awoke the pensive stillness of the quiet home.

The frigate continued on her course, and for several hours a deep gloom prevaded every part of her: this dejection became more apparent when the name of the unfortunate man was called out at the grog-tub, and the old caterer of his mess answered in a low husky voice, "*He is drowned Sir.*"

Soon, however, the cheerfulness resumed her sway; then a violin was heard upon the berth deck, and then the dead and the peril of the storm were alike forgotten.

Sailors are a strange race—they weep when they do weep, as they pull a rope—that is with all their might; but when any one pipes belay, the grief of their spirit passes like a shadow away, and the future is no longer cared for; while the past is entirely forgotten.

The steamboat "Albany," which left Albany yesterday morning, was obliged to anchor at Catskill, in consequence of the breaking of some of the machinery; the passengers, 160 in number, were brought into this city by the North America, which arrived this morning.

The North America returned almost immediately, taking the day route of the Albany.

☞ The President, it is said, has renounced his first purpose of going to Tennessee this summer, and will pass the hot months, instead, at the *Rip Raps*, where the sea air and sea bathing will, it is hoped, reinvigorate his system.

[From the London New Monthly Magazine.]

"ALL HEART."

When I first knew Tom Richards at school, he was a thoughtless, idle, dirty naughty boy; he cared for nobody, and it was evident nobody cared for him. He was a snarer of birds, a killer of cats, a tormentor of dogs; the dread of all little boys and the scout of all big ones. From this let no one imagine that Tom wanted feeling; snaring birds, killing cats, tying kettles to the tails of dogs, and frightening little boys out of their wits, were all matters of mere amusement. But if you talked to Tom in an angry tone, or above all if if you rapped Tom's knuckles, Tom's eyes filled with tears, and it was evident that Tom's feelings were hurt.

Tom's tears, in fact lay near his eyes, and on small occasions would blubber like a girl. This was by some supposed to indicate deep feeling, and certain it is that the prevalent opinion was that Tom had a *very good heart*.

Now, I must confess, that I thought but little about Tom at the time, but had I been asked to give an opinion, I should have said, that if you wished to trace his tears to their source, his heart was the very last place you should have thought of; bodily pain or wounded vanity, the loss of a plaything or the confiscation of a tart, would make his eyes twinkle. But little as I could then pretend to penetrate into the motives or actions of men or boys, I should have said that tho' Tom certainly gave no evidence of possessing a *bad* heart, he had never so far blubbered himself into my good graces, as to make me believe that he had a particularly *good* one.—Tom Richards and I, in fact, knew but little of each other; we sat on different forms, played at different games, and whether he or I first quitted the school was a matter (I should imagine) little noted by either, whichever may have been the one left behind.

He was the son of a very rich mercantile man; I one among many descended from a younger brother, a colonel in the army, who had very early in life united himself to a charming young lady without a penny.

I was therefore left to carve out my own destiny; and for many years after I quitted school, I was far away in a foreign clime diligently toiling for independence. I was absent twenty years, and then came home, with a face quite as yellow as the gold which I had contrived to scrape together, and though by no means a nabob, I possessed sufficient to insure my future comfort. I confess I think I was wiser to come back and settle down contented with my little competency, than to go on toiling, as many do, amassing wealth, and sacrificing health—digging out dollars for other people, and graves for themselves. On my return to England after so long an absence, I felt a lonely being; and after sojourning in London sufficiently long to become very sick of the Oriental Club; I resolved to settle in Cheltenham, partly because I thought the waters would (like Rowland's Kalydor) be beneficial to a faded complexion; but principally because many excellent families, formerly well known to me in India, had made that pretty town their home. With them I passed my time pleasantly enough, and could carry and mullagatawney have made me insensible to the chill breezes of a Gloucestershire atmosphere, I might still have imagined myself a native of Calcutta or Bombay. At an evening party I one night encountered a fat, good-humored, little man, who was my partner in a rubber of whist: little passed between us beyond the usual interchange of civilities common among strangers so circumstanced: I was aware that his name was Richards, a common name enough, and after paying him the few shillings which were his due as victor of the green cloth, I wished him good evening.

The next day, soon after the removal of my morning meal, to my very great surprise, Mr. Richards was announced, and he immediately entered the room in a state of hurry and agitation, for which it was impossible for me to account. He came forward rapidly, grasped my hand, looked at me with a pair of wet, twinkling eyes, and wiping them with a pocket handkerchief, sank into an arm-chair.

"The poor man," thought I, "is periodically a lunatic, and now the fit is upon him!—how shall I get him out of my house?"

I stood upon my own hearth rug, irresolute what step to take; the servant had left the room, and if I were to ring the bell, I thought my new acquaintance might be irritated: I looked at him in silence.

Mr. Richards, with his eyes still wet, gave me a look of April smile, and rapidly articulated "Jones!"

I have not before made the avowal to the reader, but my name *is* Jones—a name familiar to the ear as Richards, perhaps more so; but the more common your name, the more necessary is it that it should be treated with becoming respect. There were not three men in the wide world who had ever hailed me as plain "*Jones*" before, and here was an acquaintance of twelve hours familiarly omitting the "*Mister*."

> The gentlemanly man, whom you prefer,
> Will know you for a year, and call you *Sir*;
> The vulgar being, whom you never seek,
> Will slap your back, and *Jones* you in a week!

Nay, here was actually a fat man of the name of Richards, calling me "Jones" at our second meeting, and holding out the bare paw of familiarity!—I drew instinctively back, and ejaculated "Sir!"

Mr. Richards started up, put his arm upon my shoulder, and cried with a flutter of sensibility, "You do not remember me?"

"Pardon me," I replied, "indeed I do not."

"No, and I did not remember *you* last night; and I dare say *I* am somewhat changed since you knew me as a boy," said the very fat man, with a sentimental sigh.

"Possibly, Sir," said I; "I certainly do not recollect you."

"My dear Jones," he replied, grasping both my hands, and affectionately squeezing them; I am Tom Richards, your old schoolfellow: what a meeting after the lapse of so many years!" and while I was endeavoring to bring to my recollection a person for whom I had never felt interested, and who had never professed nor evinced any interest for me, he was indulging in a fit of sensibility, from which he was suddenly moved by a knock at the door.

"A visiter!" he exclaimed: "how provoking that such a meeting should be interrupted: I am unfit to meet any one:—adieu, friend of my early days! I trust we shall often meet."

Saying this he hurried out of the room, and I was fortunately spared the necessity of evincing that I had but a very indistinct recollection of Master Tom Richards, and felt no gratification whatever at being made acquainted with the fatness and sentimentality of the middle-aged gentleman into whom he was now transformed. To my new visiter I laughingly described the scene, and found that he was well acquainted with the actor who had just precipitately quitted the stage. "It is so like Mr. Richards," said he; "he is all heart: when next you meet, receive him kindly, for he feels all that he professes, or fancies that he feels it, which amounts to much the same thing: his feelings are skin deep; they are aroused by any thing or nothing, and never last long; but still, poor man, he has the best heart in the world."

I soon had frequent meetings with my quondam schoolfellow, and what I saw of the man very soon recalled vividly to my recollection the boy whom I had so entirely forgotten. His father's wealth had insured him independence without the necessity of choosing a profession; but to increase his income he had very recently taken a step which had nearly reduced him to beggary. He had advanced a very large sum to an individual on usurious and most exorbitant interest; the borrower had absconded, and the illegality of the transaction had left the lender without a chance of redress. His constant topic was the ingratitude of his friend; not one word was said about the pecuniary advantage which he was himself to have derived from the transaction; the tale he told was one of disinterested friendship on the one side, and of calculating cruelty on the other; of money generously advanced, and the repayment fraudulently evaded; and then the disappointed usurer would twinkle his wet eyes, and people, who knew nothing about the real state of the case, pitied the poor Pylades, who had been so ungenerously treated by a runaway Orestes.

He had a wife and several children, of whom he always spoke with conjugal and parental fondness; he would even on the commonest occasions, and with the most uninterested acquaintance, talk himself into a paroxysm of uxorious tenderness and cry about nothing. To me it seemed an anomaly, that the same man should thoughtlessly at the card table, and elsewhere, lavish the money which might have rendered Mrs. Richards and the little ones comfortable; and often did they experience the most distressing privations, and encounter difficulties brought upon them solely by his want of thought. At the time of his wife's confinement, she has been hurried off to a prison, and after her recovery the whole family have for months inhabited a garret, Mr. Richards perforce enacting the part of maid of all work; and not once only did all this happen; once it might really have been the result of want of thought; but it occurred again and again, and to me the conduct of Mr. Richards appeared utterly unfeeling and *heartless*.

"Heartless!" said somebody to whom I had ventured to express this opinion; "heartless; oh you wrong him poor fellow; he is *all heart*."

This appeared to be everybody's opinion, and I began to be persuaded that what every body said must be true; particularly as Mr. Richards sought me out with persevering assiduity, and was perpetually doing deeds that certainly carried the appearance of extraordinary good nature.

He was in a state of nervous excitement until he had teased me into employing all his own tradespeople; he appeared to be quite as intimate with his baker and his baker's wife as he was, or as he affected to be, with me; and had his butcher been, like myself, his school fellow, he could not have evinced a warmer interest in his welfare. Now all this anxiety to bring custom to the shops of particular tradespeople was called good nature, the emanation of his particularly good heart; I must confess that when I met with bad joints, and tough morsels, and fared infinitely worse than I had done before I changed butchers, I could not but suspect that a desire to render himself of importance, and the fidgetiness of a busybody, were the real sources of his apparently benevolent actions. The man who has nothing to do is ever sure to make much ado about nothing; and thus it was that Tom Richards spent his life in legislating for other people's establishments, calculating the consumption in their kitchens, and maintaining the virtues and vices of their domestics.

For my own part, however, though I could not endure his invariably calling me "Dicky Jones" in all societies, and in the loudest key, I began to think more favorably of him; and having lived so long in a distant country where the habits of life are so dissimilar to those of England, an assistant overseer of my weekly bills was not so disadvantageous as it might have been to others; I therefore became Mr. Richards's plaything; and how he could have passed his time before my arrival, is more than I can guess.

He one day found me grumbling over an ill-dressed curry which my cook, who certainly, take her for all in all, was not a bad one, had sent me up for my tiffin. What odd names do people give to their mid-day meal? The English word luncheon is bad enough; the French word *goûte* is infinitely worse; and as for the Indian tiffin, I never could endure it.

"I hear you are going to part with your cook," said my visiter, "I can recommend you a perfect treasure of such a servant—I would take her myself, only mine is a treasure too; but I know that the one who is going to leave her place is the best creature in the world."

Hearing these words while I was masticating an unpalatable mouthful, I was instigated to the immediate discharge of my really very tolerable cook; and that very evening a respectable looking young girl was installed in her place. Words cannot describe the dinners which were set before me; soup, fish, flesh, and fowl were alike detestable; and at the end of a week, I summoned before me the offender. After briefly enumerating her delinquencies, I paused for a reply, and to my astonishment, the girl answered,—

"Law, Sir, I never professes to be no cook."

"No cook!" said I, "in what capacity did you live with your late master?"

"As nursery maid, if you please, Sir."

"Nursery maid!" said I, "Were you never a cook before?"

"No, Sir, never;" she answered with a curtsey, "except once that I helped in the kitchen when Dorothy scalded her foot."

"Then what on earth made you come to me?"

"Why, Sir," said the girl, "Mr. Richards, you knows, is such a kind gentleman, and has such a good heart, and hearing I was out of place, he came and said I could but try."

"Try!" said I in a fury, "it's well you didn't poison me;" and the poor experimentalist was immediately sent about her business. Mr. Richards, I am sure, thought me a brute, when I very

unceremoniously upbraided him for the [illegible] duty. I leave you the task of revealing to the lady [illegible] and mortification at what you have involved her."

"Oh," said Tom Richards, "you little know me, I am all heart!"

"A good heart," I replied, "is a good thing, but pray, bear this in mind,—those who act from impulse, may, at the moment, appear to do very good-natured things, yet disagreeable results may afterwards prove that a little cool deliberation would have been better: however good your *heart* may be, be assured that it requires a good *judgment* to guide it."

T. H. B.

Indian Quakers, or Sads.—The people of this sect, chiefly traders, (though some are zumindars, cultivators, and artisans,) seem to be thinly scattered over the British provinces; and they meet annually during the *Hooly* at such places as their leaders choose to select. On the present occasion, about three thousand persons of both sexes and various ages assembled at Delhi. Their head quarters, distinguished by a double-poled tent, were in one of the serais of Treveiyanpore, where the *Sads* observed the ceremonials of their religion, at sunrise and sunset, for several days. The whole congregation at these hours, forming a sort of circle, repeated a form of prayer, and chanted a hymn in the open air. The sacred book of their faith, (called simply *Pothee,*) they informed me was read and expounded in the tent by an individual elected for life, or during good behaviour, whom they would not designate *Guroo, Pundit,* or *Padree,* so that I conclude he is accounted a layman. From this person I learned the following particulars respecting the tenets of the *Sads* which he said were enjoined in their scriptures. The *Sads* worship only one God, the Creator of all things, and disown every kind of idolatry. They maintain the equality of man, make obeisance to none, and recognise no distinction of caste or rank, though they profess homage to virtue, and show contempt for vice, in their conduct towards others. They are not permitted to serve as soldiers, nor to use arms for offensive purposes; but it is allowable for them to fight in self-defence. The dress of the men must be entirely white, and ornaments of gold and silver are thought indecent in males; but the women, it would appear, are permitted to wear some jewels, and colored clothes. Both sexes are strictly forbidden to eat anything that has lived, to get intoxicated, or to smoke tobacco. *Sads* cannot take an oath; and in the courts at Mirzapore, where they are numerous, their simple affirmation, I was told, is held equivalent. Every one of this creed must earn a livelihood by honest means. If reduced to poverty through infirmity or inevitable misfortune, he is supported by his brethren in faith; who expel him, however, if his destitution arise from indolence or misconduct. A *Sad* can have but one wife, and she only one husband.—Adultery or concubinage in either of them is severely punished. In regard to a future state, they believe the righteous to enjoy happiness in the presence of the Almighty, and the souls of the wicked to transmigrate into brutes. They seem to have no conception of any other hell than this earthly degradation. The *Sads* own themselves Hindus in blood, but eagerly disclaim the polytheism and superstition of their countrymen. They define an avatar to be an inspired man commissioned by the Deity, though no incarnation of the Godhead; and from such a person they pretend to derive their sacred book. They are theists, apparently of the Vedanti school; whence Nanc, the patriarch of the Seiks, as distinguished from Singhs, or followers of the Gurn Govind, probably derived the peaceful tenets of a faith by far too refined to endure among barbarians. Is not much in the creed of these sects, as well as that of Ram Mohun Roy, stolen, in Sanscrit fashion, through Arabic or some other channel, from the Greek of the Epicurean philosophers? When informed of the peculiarities of a religious order in England who call themselves *Friends*, the *Sads*, having heard something of them before, proposed now to hold a special meeting to prepare an address to a sect which so much resembled their own; and, to promote their intercourse, I have engaged to forward their communication to Joseph Pease, M. P. for Durham.—[Delhi Gazette.]

Delirium Tremens.—Extract from the second number of a series of essays published in the Springfield Gazette on the subject of temperance:

Delirium tremens is one of the most singular of diseases. The visions of one that is attacked with it, are at one time perfectly terrific, and sometimes ludicrous beyond conception; and sometimes, especially if the patient is a man of talent, they are the wildest mixture of the sublime and ludicrous, at one moment chilling the attendants with horrors, and the next almost convulsing them with laughter. I have seen a man busily picking up fourpence half pennies, suddenly gather black horror in his countenance of a devil that was just ready to pounce upon him—in a moment more the scene was changed; millions of rats pranced over the bed clothes, and he amused himself with their tumbling over each other. The visions are commonly very evanescent, the scene changing constantly, but sometimes the same vision will continue for a great length of time.

I recollect a patient who sat at his window all day, watching the movements of a devil, who, he said, had a bar in his hand, and was flying about, raising up this and that building with it. The delirium in this case had a singular termination. His wife was absent, and when she came home, he said to her, "Well wife, I'm glad you have come home, for there's a devil here that says I must go with him, and I want you to drive him off," and from that moment he saw nothing more of the devil. It would be well if wives could always cast the devils out of their husbands as easily as this.—In this connexion, I will mention the termination of another case related to me by my friend, Dr. ——. The patient for several days and nights had been chasing dogs, cats, rats, devils, &c., from garret to cellar. At length he went into the room where the family was, took down the family Bible, read a long chapter, then asked the Dr. to pray. At the conclusion of the prayer, he rose from his knees a sane man.

It is a remarkable fact that devils are almost always among the visions of disease. I can remember but very few among all the patients that I have seen suffering with it, that did not in the course of the attack see a devil—commonly they see a great many. A man one ran in great haste to a clergyman of my acquaintance, and said, "Show me quick, quick, that passage, Resist the devil and he will fly from you—for there are more than forty devils after me, there's a legion of them." I recollect one man who went one step beyond most patients—he saw devils shod with scuts clattering about the house. This man was possessed of fine talents, had a lovely family; and was surrounded by a great number of relations, among whom he would have been almost an idol, if he had not thus given himself up to destruction.

[*From the American Monthly Magazine for May.*]

Boat Song.

We court no gale with wooing sail,
We fear no squall a'brewing:
Seas smooth or rough, skies fair or bluff,
Alike our course pursuing.
For what to us are winds, when thus
Our merry boat is flying;
While bold and free, with jocund glee,
Stout hearts her oars are plying.

At twilight dun, when red the sun,
Far o'er the waves flashes;
With buoyant song, our barque along
His crimson pathway dashes.
And when the night devours the light,
And clouds are thick'ning o'er us;
The stars steal out, the skies about,
To dance to our bold chorus.

Sometimes near shore, we ease our oar,
While beauty's sleep invading;
To watch the beam through her casement gleam,
As she wakes to our serenading.
Then each who will may a bumper fill,
Ere we bound again o'er the billow;
With a blue-jacket's toast to the girl he loves most,
As she dreams of him on her pillow.

Thus on, and on, till the night is gone,
And the garish dawn is breaking;
While landsmen sleep, we seamen keep
The soul of frolic waking.
And though lonely then may our craft look, when
To her moorings Day has brought her,
By the moon smain she is launched again,
To dance o'er the gleesome water!

RAILROAD CASTINGS.

MANY A. WARD, Proprietors of the Albany Eagle Air Furnaces and Machine Shops, will make to order car wheels, chairs and boxes, and every other description of castings required for railroads. R-1y. [illegible]

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☞ RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlem Railroad now in operation. [illegible]

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	Par.	Ask.	Offer.
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Ithaca and Owego	—	—	—
Saratoga	—	122	117
Harlem	—	109	108½
Boston and Providence	100	120	119½
New-York and Albany	—	—	—
New-Jersey Railroad and Transportation Line	100	124	117
Camden and Amboy	100	—	—
Providence and Stonington	100	106	105
Boston and Worcester	—	105½	105½
Philadelphia and Trenton	100	101	100
Utica and Schenectady	100	129	128
Jamaica	—	117	115
Saratoga and Washington	—	—	—
Berkshire	—	107	106

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Wanted, a partner in an extensive Printing Establishment. No one need apply who is not a thoroughbred printer, competent to superintend and direct an office in which upwards of 30 persons are employed, and able to furnish $3000 cash capital. The best of references will be given and required. Letters, with *real* name, may be addressed to P. P. P., Post Office, New-York, postage paid, and they will be promptly attended to. May-tf

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This work is composed of the choicest articles of the three preceding works; its character may therefore be understood by reading those advertisements. It has been published at $5, but will be, hereafter, at $4 per annum—always in advance; each quarterly number to contain about 220 pages.

These works may all, or either of them, be had of S. Blydenburgh, 96 North Pearl street, Albany; D. Hale, 124 Washington street, Boston; Fessenden, Philadelphia; or of the Proprietor and Publisher,

D. K. MINOR,
35 Wall street, New-York.

PUBLIC NOTICE.

THE undersigned, Commissioners for the amelioration of the navigation of the Richelieu or Chambly River, will receive at their office, in the borough of St. Denis, until the 15th of June next, sealed propositions for the construction or erection of a Dam or *Chaussee*, with a Lock; to be erected about three miles above the village of St. Ours, either in Cut Stones, Common Stones, *Pierres Brutes*, or in Wood, according to the plans and specifications made by W. B. Hopkins, Esqr., Engineer, deposited, and where they can be seen at any time, in the hands of Joseph Cartier, Esqr., one of the said Commissioners, at St Antoine.

All propositions addressed by the mail must be sent free of postage

Two good securities will be required for the due execution of the aforesaid works

Further information can be had at any time, from the undersigned, in addressing them at their respective residences, or from the said W. B. Hopkins, Esqr., at Bunker's Hotel, at the Chambly Basin.

ROCH DE ST. OURS, at St Ours.
JOSEPH CARTIER, at St. Antoine.
JOS. T DROLET, at St Marc.
LS. C DUVERT, at St Charles.
L. F. DESCHAMBAULT, at St. Denis.

Office of the Commissioners, } 20—4t
St. Denis, May 11, 1835. }

The above Dam and Lock are in dimensions as follows: Lock 200 feet, Chamber 50 feet wide; Dam 675 feet long, 6 feet high.

Engineer Department of the New York } and Harlem Railroad, May 2d, 1835. }

TO RAILROAD CONTRACTORS.—Proposals will be received at this Department until the 29th of May, for Excavating a Tunnel through rock at Yorkville, from 18 to 24 feet in height, 24 feet wide, and 844 feet long.

For 15000 yds. of Rock, and 6000 yds. of Earth, north and south of the same.

Proposals will also be received for making an Open Cut Excavation where said Tunnel is proposed, which, together with other excavations, will amount to about 65,000 yds. of Rock, and 12,000 yds. of Earth.

Plans and specifications will be furnished 10 days previous to the time above mentioned.

The work will be required to proceed immediately after being put under contract, and to be completed by the 1st of December, 1836. Satisfactory security will be required of the contractors for the faithful performance of the work.

Communications may be addressed to the Engineer, at his office, No. 9 Chambers street. By order of the Board of Directors, JOHN EWEN, Jr. Engineer
m2 28 of the N. York & Harlem Railroad Co.

MILL-DAM FOUNDRY

ON MONDAY, June 1, at 12 o'clock, at City Hall, (unless previously disposed of at private sale,) will be sold by auction, the above well known establishment, situated one mile from Boston. The improvements consist of—

No. 1. *Boiler House*, 50 feet by 30 feet, containing all the necessary machinery for making boilers for *Locomotive* and other steam Engines.

No. 2. *Blacksmith's Shop*, 50 feet by 20, fitted with cranes for heavy work.

No. 3. *Locomotive House*, 54 feet by 25, used for putting together Locomotive Engines. Several of the best Engines in use in the United States have been put in this establishment.

No. 4. A three story brick building, covered with slate, 120 feet by 46, containing two water-wheels, equal to 40 horse power; Machine Shop, filled with lathes, &c.; Pattern Shop; Rolling Mill and Furnaces, capable of rolling 4 tons of iron per diem, exclusive of other work; three Trip Hammers, one of which is very large; Engine for blowing Cupola Furnaces, moved by water-wheel; one very superior 12 horse Steam Engine, which could be dispensed with; and a variety of other machinery.

No. 5. An Iron Foundry, 80 feet by 45, with a superior air Furnace and two Cupolas, Core oven, Cranes, &c. fitted for the largest work. Attached to the Foundry is a large ware-house, containing Patterns for the Castings of Hydraulic Presses, Locomotive and other Steam Engines, Lead Mill Rolls, Geering, Shafts, Stoves, Grates, &c. &c. These were made of the most durable materials, under the direction of a very scientific and practical Engineer, and are supposed to be of great value.

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The above establishment being on tide water, presents greater advantages for some kinds of business than any other in the United States. Coal and iron can be carried from vessels in the harbors of Boston, to the wharf in front of the Factory, at 25 to 30 cents per ton. Some of the largest jobs of iron work have been completed at this establishment; among others, the great chain and lift pumps for freeing the Dry Dock at the Navy Yard Charleston.

The situation for Railroad work is excellent, being in the angle formed by the crossing of the Providence and Worcester Railroads. The Locomotive "Yankee," now running on the latter road, and the "Jonathan," purchased by the State of Pennsylvania, were built at these works. With the Patterns and Machinery now in the premises, 12 Locomotives and as many tenders, besides a great quantity of cars and waggons, could be made per annum.

For terms, apply to

THOS. J. ECKLEY, Treas'. &c., Boston, or to
ROBERT RALSTON, Jr., Philadelphia.

Boston, April 21, 1835.

RAILROAD CASTINGS.

MANY & WARD, Proprietors of the Albany Eagle Air Furnace and Machine Shop, will make to order car wheels, chairs and knees, and every other description of castings required for railroads. R-1y febl

RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

☞ Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS.

Also, Flange Tires turned complete.

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PATENT HAMMERED SHIP, BOAT, AND RAILROAD SPIKES.

☞ Railroad Spikes of every description required, made at the Albany Spike Factory.

Spikes made at the above Factory are recommended to the public as superior to any thing of the kind now in use

Ship and Boat Spikes made full size under the head, so as not to admit water.

Orders may be addressed to Messrs. ERASTUS CORNING & CO., Albany, or to THOMAS TURNER, at the Factory, Troy, N. Y. sept.12-1y

RAILWAY IRON.

95 tons of 1 inch by ½ inch, } *Flat Bars* in lengths of
200 do. 1½ do. ½ do. } 14 to 16 feet, countersunk
40 do. 1½ do. ½ do. } holes, ends cut at an angle
800 do. 2 do. ½ do. } of 45 degrees, with splic-
800 do. 2½ do. ½ do. } ing plates and nails to
soon expected. } suit.

250 do. of Edge Rails of 36 lbs. per yard, with the requisite chairs, keys and pins.

Wrought Iron Rims of 30, 33, and 36 inches diameter for Wheels of Railway Cars, and of 60 inches diameter for Locomotive wheels

Axles of 2¼, 2⅝, 2¾, 3, 3¼, 3½, and 3¾ inches diameter for Railway Cars and Locomotives of patent iron.

The above will be sold free of duty, to State Governments and Incorporated Governments, and the Drawback taken in part payment. A. & G. RALSTON.

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Models and samples of all the different kinds of Rails, Chairs, Pins, Wedges, Spikes, and Splicing Plates, in use both in this country and Great Britain, will be exhibited to those disposed to examine them. d12mecowr

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☞ Compasses of various sizes and of superior quality warranted.

Leveling Instruments, large and small sizes, with high magnifying powers with glasses made by Troughton, together with a large assortment of Engineering Instruments, manufactured and sold by

E. & G. W. BLUNT, 154 Water street,
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SURVEYING AND ENGINEERING INSTRUMENTS.

☞ The subscriber manufactures all kinds of Instruments in his profession, warranted equal, if not superior, in principles of construction and workmanship to any imported or manufactured in the United States; several of which are entirely new, among which are an Improved Compass, with a Telescope attached, by which angles can be taken with or without the use of the needle, with perfect accuracy—also a Railroad Goniometer, with two Telescopes—and a Leveling Instrument, with a Goniometer attached, particularly adapted to Railroad purposes.

WM. J. YOUNG,
Mathematical Instrument Maker,
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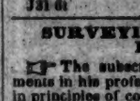

The following recommendations are respectfully submitted to Engineers, Surveyors, and others interested.

Baltimore, 1833.

In reply to thy inquiries respecting the instruments manufactured by thee, now in use on the Baltimore and Ohio Railroad, I cheerfully furnish thee the following information. The whole number of Levels now in possession of the department of construction of thy make is seven. The whole number of the "Improved Compass" is eight. These are all exclusive of the number in the service of the Engineer and Graduation Department.

Both Levels and Compasses are in good repair. They have in fact needed but little repairs, except from accidents to which all instruments of the kind are liable.

I have found that thy patterns for the levels and compasses have been preferred by my assistants generally, to any others in use, and the Improved Compass is superior to any other description of Goniometer that we have yet tried in laying the rails on this Road.

This instrument, more recently improved with a reversing telescope, in place of the vane sights, leaves the engineer scarcely any thing to desire in the formation or convenience of the Compass. It is indeed the most completely adapted to lateral angles of any simple and cheap instrument that I have yet seen, and I cannot but believe it will be preferred to all others now in use for laying of rails—and in fact, when known, I think it will be as highly appreciated for common surveying.

Respectfully thy friend,
JAMES P. STABLER, Supt of Construction of Baltimore and Ohio Railroad.

Philadelphia, February, 1833.

Having for the last two years made constant use of Mr. Young's "Patent Improved Compass," I can safely say I believe it to be much superior to any other instrument of the kind, now in use, and as such most cheerfully recommend it to Engineers and Surveyors.

E. H. GILL, Civil Engineer.

Germantown, February, 1833.

For a year past I have used Instruments made by Mr. W. J. Young, of Philadelphia, in which he has combined the properties of a Theodolite with the common Level.

I consider these Instruments admirably calculated for laying out Railroads, and can recommend them to the notice of Engineers as preferable to any others for that purpose.

HENRY R. CAMPBELL, Eng. Philad. and Germant. and Norriet. Railroad
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